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VETERINARY MEDICINE

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No. 12
VOL. XXIV

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Chicago, U. S. A.

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D. M. Campbell, Editor A. T. Kinsley, Associate Editor

In three series of five tests each, made at the Michigan Agricultural Experiment Station, the use of small top milk pails decreased the bacterial content of the milk an average of 30% below that for milk drawn into open top pails; the use of sterile pails gave milk having a bacterial count only 20% of that of pails washed but not sterilized, and discarding the fore milk decreased the bacterial content 3,000 organisms per cc.

Intestinal coccidiosis is a rather fatal disease in young rabbits. The manifestations are: profuse diarrhea, inappetance, progressive languor, and rapid emaciation. The malady is rarely fatal to old rabbits.

An excess of Vitamin D prevents growth and will, if long continued, cause loss of weight. Under normal conditions, an excess of vitamins is unusual but the clinician should not overlook the possibility of either excess or insufficient nutrients.

According to a report of investigations by Nighbert and Connelly, the condemnation of parts of swine due to kidney worms at Moultrie, Georgia, amounts annually to approximately $80,000.00, or nearly 30 cents for each hog slaughtered. The loss incident to this parasite to the swine industry of America is tremendous.

Tularemia, newly discovered disease of rabbits, rodents and men, may also affect cats, muskrats, pigeons, ring-necked pheasants, grouse and quail, it appears from studies reported to the American Public Health Association by Dr. R. G. Green and E. M. Wade, of the University of Minnesota and the State Department of Health. This new disease which has caused much concern in public health circles, is acquired by men who handle infected animals. The fact that many more kinds of animals may have the disease greatly increases the danger to human beings by increasing the possible sources of infection.—*Science.*

The demonstration of the therapeutic effect of desiccated hog's stomach in pernicious anemina, recently reported by Drs. Cyrus C. Sturgis and Raphael Isaacs, of the University of Michigan, and Dr. Elwood A. Sharp, of Parke, Davis and Company, follows by just three years the announcement of the liver treatment for the same disease developed by Drs. G. R. Minot and W. P. Murphy, of Harvard University. Another Harvard scientist, Dr. William B. Castle, has made an epochal contribution to the understanding of the disease by his recent investigations which showed that the required antianemic factor is obtained from beef by the action of the normal gastric juice.—*Science.*

In a series of tests it has been found that between 20 and 30% of calves are immune to blackleg. Whether or not this percentage of calves immune to blackleg is increasing, because of almost universal vaccination, is of interest.

The 6,000,000 farmers in the United States are the most efficient farmers on earth. In numbers, they are one-twentieth of the world's farmers, but they produce two-thirds of the world's corn, three-fifths of the world's cotton, one-half of its tobacco, one-third of its hogs, one-third of the poultry, one-fourth of the oats, one-fifth its wheat, one-seventh of its cattle and one-tenth of its sheep.—Arthur M. Hyde, Secretary of Agriculture.

ELEVENTH INTERNATIONAL VETERINARY CONGRESS

The following American veterinarians have been invited to present papers at the Eleventh International Veterinary Congress, which will convene in London, August 4-9, 1930:

List of American Reporters

Dr. W. E. Cotton, infectious abortion of cattle, sheep, and swine.
Dr. J. R. Mohler, standardization of biological products.
Dr. A. Eichhorn, standardization of biological products.
Dr. M. C. Hall, the use of drugs in the treatment of diseases caused by Nematode and Trematode worms.
Prof. P. A. Fish, milk fever.
Dr. M. Dorset, swine fever (hog cholera).
Dr. W. A. Hagan, bovine sterility.
Dr. L. Van Es, diseases of the new-born.
Prof. K. F. Meyer, theileriases.
Dr. J. R. Beach, fowlpox and coryza.
Dr. F. R. Beaudette, fowl typhoid and bacillary white diarrhea.

The reporters selected are sufficient guarantee of contributions from America of the highest class, but no reader will have any difficulty in thinking of some subjects more representative of the outstanding achievements of the profession in America than those selected. Were Mohler to discuss tuberculosis, Eichhorn foot-and-mouth disease and Hall tick fever, to mention only three of a number of changes in the program that will occur to almost everyone, the program would be materially improved.

Political considerations one must assume is the final arbiter of the program of an European veterinary meeting, just as it is in a convention for treaty making, arms limitation, a red cross agreement or anything else that occurs within the confines that bound Europe. European countries have not been able to control, with any promptitude, outbreaks of foot-and-mouth disease or to reduce the prevalence of tuberculosis in cattle, or to lift the burden of any serious parasitism from the live stock industry and they apparently do not want to be reminded officially of their failures by a record of success in these matters.

Reports Will Be Furnished All Members

All members of the Congress irrespective of whether they attend the London meeting, will be furnished bound copies of the report of the meeting. For the Tenth Congress, the report comprised three volumes. Because of the increased cost of printing and the larger report that is anticipated for the next Congress, the membership fee has been raised to $7.50. It is highly desirable that American veterinarians have a large membership in the Congress and the reports will well repay anyone for the cost of membership. Ordinary membership is limited to duly qualified veterinarians. To become a member, send your application, together with the membership fee ($7.50), to Dr. Adolph Eichhorn, Pearl River, New York, or to Dr. L. Van Es, Lincoln, Nebraska.

Official Veterinary Tour of Europe

This is a good place to again remind readers of the A. V. M. A. official tour of Europe next summer under the direction of Doctor Eichhorn. The itinerary is almost a duplicate of the veterinary tour managed by Doctor Eichhorn in 1914. The great success of the earlier tour augurs well for the success of the tour next summer. Write him for further information. His address is Pearl River, New York.

Dioctophyme Renalis, a Little-Known Parasite of Silver Foxes

By FRITZ VOLKMAR, Fargo, N. D.

THE occurrence and finding of worms in a body cavity which has no outside openings, does not only excite the curiosity of the layman on account of the baffling question, "How did the worm get there?" but it arouses, also, the interest of the pathologist on account of the rarity of such findings and the confronting him with the many biological factors involved. Parasites may enter a closed body cavity accidentally. For instance, intestinal worms, in their search for food, may perforate the intestinal wall and thus into the abdominal cavity. Again, other parasites may be guided, in their erratic wanderings through the animal body, by chemotaxic influences which will finally lead them into one of these cavities. It is assumed that this is the explanation for the finding of *Dioctophyme renalis* in the abdominal cavity, since in such instances the worm is invariably found adhering to the liver. The natural habitat of this parasite, as its name implies, is the kidney, or rather the pelvis of the kidney. It has also been found in the bladder and the ureter, but this is evidently a natural migration from the renal pelvis. Although its locomotion is said to be by friction; yet, it is not so easy to explain by which route the worm larva reaches the kidney in the first place, considering the evidence that the invasion is contracted by way of the gastro-intestinal tract. Direct transmission by means of ingestion of worm eggs has proved unsuccessful. Some feeding experiments, however, have pointed toward certain fishes as the intermediate host. Nevertheless, the complete life history of the parasite has not yet been definitely established. If fishes play a role in its life cycle, then we may understand its occurrence in omnivorous and in ichthyophagus animals, such as pig, dog, wolf, fox, weasel, mink, marten, otter, seal, etc., while its occurrence in horse and ox remains rather enigmatic. The reports of its finding in man are questioned and considered doubtful at the present time.

Recently, I had an opportunity to diagnose as *Dioctophyme renalis* (Fig. 2), female sex, a nematode parasite which was found attached to the visceral surface of the liver in a silver fox raised near Minot, North Dakota. This is the first observation of this parasite in the State of North Dakota, and probably also for the entire United States as regards its occurrence in domesticated silver foxes.

Dioctophyme renalis is considered as the largest nematode known. The mature specimens are said to measure from 13-40 cm. in length and 4-6 mm. in thickness for the male sex, and 20-102 cm. in length by 5-12 mm. in thickness for the female sex. The specimen which came to my observation is 79 cm. long and 8 mm. thick. It, also, has the blood-red color which is characteristic of this species. The red color is most intense at the anterior extremity and fades out toward the posterior extremity, which is pale yellowish. The worm is finely striped transversely. Its extremities are tapering, the anterior end rather abruptly and the posterior one more gently. The mouth is triangular and surrounded by six small papillae. The vulva is situated in the anterior part of the body about 5½ cm. from the mouth. The anus is terminal.

The eggs (Fig. 1) of *Dioctophyme renalis* are very characteristic. Their form is barrel-shaped. The shell has a covering, about 5.4 m. in thickness, which appears wrinkled, causing numerous dimples on its surface. The pitted section reflects a brownish color, but the thickened poles are, for the most part, colorless and smooth. The egg size varies from 64-68 microns long by 40-50 microns wide. The eggs of the specimen in question are on an average 67.5 microns long by 49.4 microns wide. The eggs do not contain an embryo when laid. They hatch

readily in the presence of moisture, though it takes about 5 months till the larvae appear. They may remain viable in the shell for several years.

There was very little history forthcoming in the present case. The parasitized silver fox was a pup 6½ months old and was found dead by the owner. In view of the suggestion that the fallopian tubes might be a portal of entry, it is unfortunate that the sex could not be learned. There was no record of any premonitory symptoms. The lesions were said to have been hepatomegalia and perihepatitis. The liver capsule was said to appear destroyed in places.

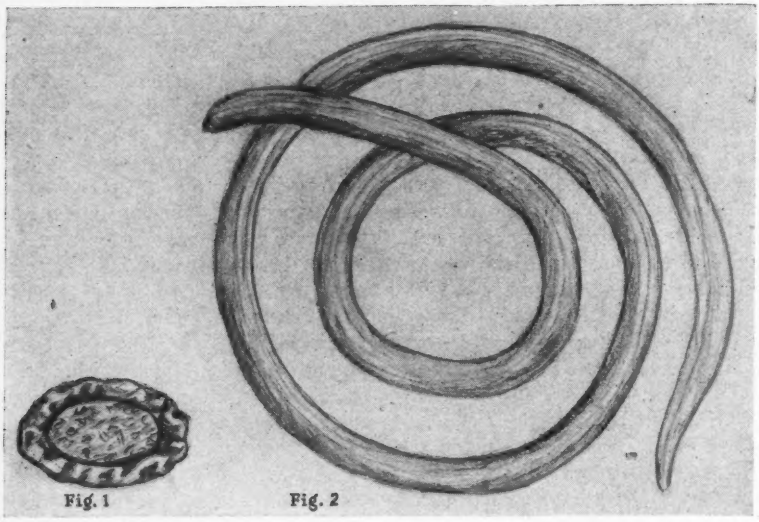

Fig. 1 Fig. 2

In dogs, the following symptoms have been noted: When the worm is still in the developmental stage and present in the kidney in a single specimen only, there may be no symptoms at all. In later stages, it may cause either hemorrhagic inflammation or cyst formation in the affected, and compensatory hypertrophy in the unaffected kidney. The outward symptoms may be those of a kidney-colic: arching of back and pain. The presence of the worm in the bladder or ureter may cause painful micturation or passing of flocculated or bloody urine. However, in all these cases where a female worm is present in the urinary passages, the finding of the characteristic parasite eggs in the urine will always enable an accurate diagnosis. But, no such diagnostic help is available if the only worm present is a male specimen or if the worm is located in the abdominal cavity, as in the case under consideration. While in a few cases of autopsies on laboratory animals, where this worm was accidentally found in the abdominal cavity, no previous symptoms had been noted, it must be assumed that symptoms would, in all probability, have manifested themselves if the animals had been allowed to live longer. It is obvious that the mechanical injury from the requirements of the active metabolism of the parasite, the toxic stimulus from the accumulated excretions and, in the case of females, from the depositions of eggs, must produce an irritating effect to the peritoneal lining and cause a more or less severe peritonitis, manifested by nervous symptoms. And, indeed, in a few cases recorded, the symptoms observed have simulated rabies and have been mistaken for such by laymen.

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Commoner Parasitic Affections of Cattle in Porto Rico

By JUAN VARAS CATALA, Rio Piedras, Porto Rico

EXTERNAL and internal parasitic affections of cattle in Porto Rico are drawbacks to the local cattle industry, also to the raising of work bulls. There is no specific beef breed on this island, as dairy cattle as well as work oxen are slaughtered for beef.

The external parasite most serious alike for native and imported cattle, is the Texas fever tick, the *Boophilus annulatus* of our student days. Native animals when young (calves) suffer from the disease and generally survive the attack thereby acquiring immunity against tick fever. Sometimes, when in the adult stage, they get a second attack, with a little or no mortality at all.

The Texas fever tick by inoculating them with the *Piroplasma bigeminum* kills 50% of the cattle imported from tick free areas of the United States. Texas fever has caused the great loss to many cattle dealers who import dairy cows from the areas above cited. I can point out the burial place of some Holstein cows priced at many hundred dollars each. Ticks reached them in the grass used for bedding. Dairy cows which pull through an attack of Texas fever, remain anemic and unthrifty for many months, entailing no inconsiderable loss during convalescence. It is usually more profitable to have them destroyed and to buy new stock. Even dariy cattle coming from the southern states, get sick with tick fever and die in spite of medical treatment with quinine, trypan blue, neo-salvarsan and other preparations.

It is my opinion that as long as there exists on this island a single infected Texas fever tick, the importations of cattle from the United States will result in losses for their importers.

I feel proud to state that the local department of agriculture is carrying on a campaign for the eradication of the *Margaropus annulatus*, by using principally the dipping vat method. At present, there are functioning over 200 vats in Porto Rico owned by the local government, private concerns and individuals. So much for the Texas fever tick problem.

Among the internal parasites, there are three which are doing much harm to the cattle business in this country. 1. The stomach worm, *Hemonchus contortus*. 2. The lung worm, *Strongylus micrurus*. 3. The liver fluke, *Distoma hepaticum*.

The stomach and lung worms affect principally young stock (up to one or two years of age), when kept on low swampy pastures, or in stables and fed with grass cut from such infected places. Sometimes, both affections attack young animals at the same time and all medical treatment is vain.

The predominant symptoms in the stomach worm infestation are: unthriftiness, diarrhea, anemia and watery swelling under the jaw. In the verminous infection I have noticed chronic cough, dyspnea, unthriftiness and hydremia.

The stomach and lung worm diseases attack a large number of calves in the Porto Rican dairies and destroy nearly 25% of their annual crop. Medical treatment is usually unavailing; prophylactic methods have given better results.

The following preventive measures have been put in practice by the writer: Use only high pasture land, abolish stagnant water holes and administer orally to each animal a correct dose of a 1% solution of copper sulphate every month. Also, owing to the lack of calcium and phosphorus in our local grazing pastures, the addition of steamed bone meal and common salt to the feed is beneficial. When minerals are fed to native and imported cattle, dietetic diseases do not occur.

I have investigated many enzootics of bo-

vine distomatosis, by performing autopsies and locating the flukes in the livers. These outbreaks occurred always when cattle were grazed on low damp pasture lands, or when grass from these infested pastures were fed in the barn. Curative treatment has proved useless. Preventive measures do a lot of good.

Recently, I caused to be examined under the microscope by a government parasitologist, feces of fifty head of cattle imported from the United States but which had been in this island over two years. The results of said microscopical investigation were that a high percentage harbored the liver fluke, *Distomum hepaticum*. Treatment with extract of male fern will be commenced soon.

PARALYSIS IN A DOG

I would like some information about a male Pekingese, age three years, who fell from a cage about four feet high, three months ago and cannot walk since, although the dog walked about five minutes after the accident.

There is no atrophy of muscles and X-ray showed no cracked or splintered vertebra or pressure on nerves. This dog seems to have lost control of motor nerve of back legs only. It can use its front legs.

The general condition of the dog is excellent, no pain on pressure. The sense of touch in hind legs seems normal. The paralysis seems to be from the stifle down.

My treatment has been potassium iodid and strychnin, also magnesium sulphate packs daily. No benefit has resulted from this treatment.—A. S. E., Ohio.

Reply: The history of this case of course, strongly suggests spinal injury and the time that has elapsed makes a prognosis of future improvement or rather for any improvement, doubtful.

It is, of course, impossible to diagnose at this distance with exactness and many times a guess is all that can be made as to these paralysis cases. Your X-ray examination eliminates several factors which might otherwise be suggested. As a guess, I would suggest what Hutyra & Marek describe as degeneration of the intervertebral discs. The fall might seem to eliminate this diagnosis, yet we have seen several such cases which followed violent running, going up stairs, etc.

The treatment is not promising although many of the cases in which we have diagnosed degeneration of the discs have recovered. I believe that your treatment is as good as any. In my opinion, time does more than anything else. There was a period during which we used electrical treatment on these cases, but since discontinuing it, the results have been just as good as before.

If the case is one of degeneration of the discs, a relapse or relapses may occur until finally the animal is permanently paralyzed.—H. J. M.

Nursing a babe from an Alpine doe in France. The cow is not the only "foster mother of the human race."

Eradicating Dourine in Arizona

By T. W. Crump, Albuquerque, New Mexico
Assistant Veterinarian, Bureau of Animal Industry

SINCE dourine seems to have been eradicated from the ranges of the Navajo Indian Reservation in Arizona a resumé of the work accomplished from the viewpoint of the bureau veterinarian in the field may be of passing interest.

At the time dourine was found to be present on these ranges an agreement was entered into between the Bureau of Animal Industry and the Office of Indian Affairs by which the latter was to undertake to gather all animals to be tested and assemble them at some suitable place designated by the bureau veterinarian for the drawing of blood samples. All responsibility and expense for this work was to be borne by the Office of Indian Affairs. The bureau veterinarians were to draw the blood samples from all horses and were to designate such animals as proved to be infected in order that officials of the reservation might make proper disposal of them.

After this method of procedure had been in effect for several years, changes in the plan of operation became necessary. It seemed essential that in each locality there be some one central authority and as a result the bureau veterinarians in the field gradually took over more and more of the work and responsibility. One difficulty experienced was lack of funds available by the Office of Indian Affairs with which to prosecute the work. There was consequent failure to gather all horses on various sections of the ranges, to slaughter reacting horses promptly, and pay indemnities to Indians. In fact, during the seasons of 1925 and 1926 the disease actually made rapid gains and some sections which had previously been freed became reinfected due to lack of control of horses in the infected areas.

Fortunately during the past season ample funds were available by the Office of Indian Affairs to reimburse Indians for horses destroyed and the bureau was able to finance and direct various activities relating to the work. It was thus possible to carry this dourine work to what now seems may be a satisfactory conclusion. It may be safely said that real progress in eradication has been practically limited to the past three years.

During the time we have been engaged in this work, several methods have been used in gathering horses for testing. All of these were finally discarded in favor of the round-up method as used on the western ranges in gathering cattle. One method was to place the veterinarian at some suitable location, usually a trading post, and depend upon the Indian owner to bring his horse to that point for testing. This proved to be a failure as the owner in many cases was not in favor of the testing, and therefore did not bring in his horses as instructed. Some owners brought in a part of their herds, holding out such animals as they believed to be the most valuable. Another method was for the veterinarians to hire crews of men to bring in the horses to the trading posts for testing. This also proved impracticable as the men employed did not work the country effectively since the veterinarians were stationed too far apart, thereby permitting owners to hold out a part of their herds. As a result all animals were not tested.

After trying several of these methods it was decided to put the veterinarians in charge of the round-up outfits and have them direct the work in the field. In this manner they were able to meet conditions as encountered. They had under their direction an agent of the Bureau, or a white lay assistant, furnished by the Office of Indian Affairs, an interpreter, and from four to ten riders and ropers,

as were required. Several such outfits were started from one end of the infected territory near enough together so that there could be no passing of the horses between them and were directed to cover certain areas of country. Riders were then sent out from each outfit and directed to gather any and all horses within their territory. These animals were then assembled at some permanent corral, if

"Working" the herd for testing. Doctor Crump is the man on the reader's left.

available, or at a new corral which it was sometimes necessary to construct of poles and brush. At other times it was found to be more expedient to make use of the natural barriers of the country and utilize a cut bank wash as a corral. In such cases the ends of the wash were guarded by some of the riders, or by ropes which were stretched across the wash and blankets, pieces of burlap or other such materials suspended from them in order to retain the animals within the inclosure until blood samples could be drawn.

The process of drawing blood consisted of roping and tying the animal securely, then extracting about three ounces of blood from the jugular vein through an aspirating needle of special make. The blood was allowed to flow into a previously sterilized bottle, after which the horse was fire branded with a number corresponding with the number on the bottle containing the blood. This branding served to identify each particular animal in that territory and later recognize any on the range that had escaped a test. As blood was being drawn and the horse branded, the agent or lay inspector put down in writing in the field record an accurate description as to sex, age, color, test number, Indian brands and any other markings such as white feet, blazed face, white or dark mane and tail. The owner's name was also recorded.

In this connection, let me say, that the owner's name gave us considerable trouble, as the Navajo tongue is not a written language, and some of the guttural sounds given by our interpreters as being the name of the owner caused us to go through some great mental contortions in order to write its equivalent in English. At first we depended largely

on the brands and would have the owner of those brands pointed out to us. Later we became familiar with the names and the owners in many instances and were able to speak a little of the Navajo language. This, of course, made the work much easier, and I believe that if we had not become familiar with the language of the Navajos, we would have had no hope of eradicating dourine.

After the serum was drawn from the clotted blood and the serum bottles labeled to correspond to the brand on the animal, they were carefully packed in wooden boxes for transportation to the Bureau laboratory at Washington, where the test for dourine was to be applied. Many of these samples were carried as far as two hundred and fifty miles by horseback, wagon, and mail stage before they finally reached the railroad. This made it necessary to pack them well in order to keep the breakage to a minimum. Every broken sample meant that some particular animal must be located again for a retest, this sometimes proving a very difficult undertaking.

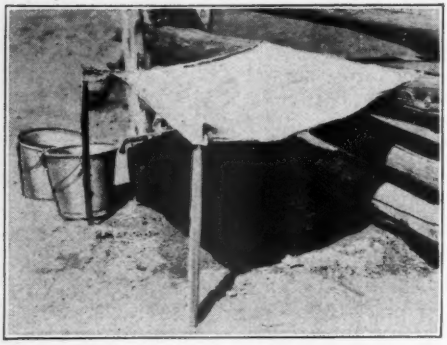
After a given territory had been covered, the outfit was moved to the next stop, a distance of from ten to fifteen miles, it being necessary always to camp where water could be had for both men and horses. Much could be said regarding the quality of the water on most parts of the reservation, but I believe that it will be best understood when I say that we were required to take chances with the cattle, sheep, horses and dogs when drinking at the open water holes.

In many instances our wagons would advance a distance of from fifty to one hundred miles before returns on the first shipment of samples were received. It then became necessary for the veterinarian or his assistant to go back over the territory, locate such animals as may have reacted positively to the test and destroy them. It was frequently difficult to find these animals, but in every instance they were located and destroyed, as early as possible after the report on the sample had been received. Another feature of the work was the gelding of all stallions at the time the mares were tested. I believe this feature of the work played a very important part in the eradication program. Since it is known that this disease is transmitted only through the act of breeding, the castration of all stallions would naturally prevent any further spread of the disease.

This last season we found a very small colt crop, possibly one per cent, whereas before the castration of the stallions we found from fifty to seventy per cent of a colt crop. This small colt crop was due to the fact that a few especially valuable stallions were concealed from us by the Indian owners. After two or three years of this work, however, there were very few mature stallions left on the range. This season practically all stallions castrated were young, from one to two years old. Ordinarily there was never much objection to the castration of these young animals, but in order to save some of the mature stallions some very strong arguments were advanced by the Indians and in some instances physical violence was threatened.

The work was far from pleasant in all respects for the Bureau men in the field, who were compelled to work in a strange country among a primitive people who did not understand the why or the wherefore of it all and who worship their horses as a part of their religious belief. This will give some idea of what was in store for the person who meddled with Navajo horses. At this point, we will explain one of the Navajo superstitions, since it has to do with the castration of stallions. It seems that the Navajo is able to assure himself as to the future of a gelded animal provided the proper ceremonial rites are observed at the time the stallion is being castrated. For instance, if a race horse is desired, it may be produced by tossing the emasculated testes the length of the body across the head to the front and smearing blood from the wound upon all four hoofs, on the nose and inside the

nostrils. If this is properly done, the animal is certain, according to Navajo belief, to have plenty of speed and long wind. If a strong pack animal is desired, the testes are tossed across the body over the back and blood smeared upon the back, where the saddle is worn, and imprints of both hands are made, in blood, rather forcibly, upon the hips. This, of course, provides all the muscle power necessary for a pack animal. As soon as we found that these rites were essential to official stallion castration, we were able, after a little practice, to imbue an



A desert refrigerator for cooling blood samples.

animal, in the eyes of the Navajo, with speed and pep in the most approved Navajo style. It is needless to say that this practice, on the better class of stallions, resulted in greatly reducing opposition to this phase of the work. However, we leave it to your imagination as to how amazing it was to see a graduate veterinarian performing these ceremonial rites while exhibiting his most solemn poker face. Had there not been a few amusing incidents of this kind, the work would have certainly become very monotonous to the men in the field.

It was necessary for the Bureau men to be cautious, diplomatic, and to understand the Indian's point of view, as well as to be efficient in their work and to avoid misunderstandings, as trouble might start without an apparent reason. It is quite certain that the Navajo will fight when he thinks he is within his rights. In looking back over the situation, I wonder that some of our men did not lose their lives. We have had on this work men from all parts of the country and I might say men with varied dispositions. Some of them made good on the work. Very naturally others were not so successful. It was found that before headway could be made the training of men for this particular work was necessary. These men were taught how to handle the Indians, instructed as to the matter of selecting employes furnished by the Office of Indian Affairs, taught to be diplomatic, hold their temper in times of trouble, and were asked to take much that all men hate to take, in order to prevent friction. They were also instructed how to do their work accurately, systematically, and efficiently and in many other things required to make an efficient Bureau man in the Indian country. After these few men had been thus trained for the work, real progress was noticeable at once.

There was frequent interference with our work on account of the pronounced superstitions of the Indian. Whenever an Indian became sick or injured in a neighborhood in which we were operating, all work stopped, as our laborers would all ask for leave in order to be present while the Indian "medicine men" effected a cure. This usually required from three to nine days, depending upon the trouble and of course, providing the patient survived that long. It was necessary for us to be always sympathetic toward all of their troubles and many peculiar circumstances arose as a result. The Indian believes that the "white horse stickers, from Washington," as we are called, were all powerful and were able to accomplish almost anything. Therefore, we were called upon to perform many peculiar and pathetic tasks for them. I have personally settled many disputes between Indians, regarding range and water rights, assisted in settling estates, decided ownership of prop-

erty and many other similar things. I have been called upon, in unavoidable emergencies, to act "professionally" as a dentist, physician, surgeon and as an undertaker. I have extracted hundreds of teeth, sutured wounds, removed splinters and larger pieces of wood from various parts of the Navajo's anatomy, set broken leg and arm bones, tapped broken ribs, prescribed for the sick and vaccinated many of them against smallpox. Since the Navajos are very superstitious about the dead, they will not bury or even touch a dead body if it can be avoided. Therefore, I have been required to act as undertaker, many times. We were required to wash and dress the body, construct a crude box from scrap lumber, usually from coffee shipping boxes, dig the grave and bury the remains. One might wonder what all this has to do with dourine eradication. I might say, in answer, that in order to gain and keep the confidence of the Indians, we were required to do hundreds of things apart from our regular work, all of which resulted in a better understanding between the Bureau inspectors and the Indians, and enlisted sympathy with our work.

During the year 1927, there were approximately 12,000 head of mares tested on the Navajo Reservation, about seven per cent of which reacted to the test. There were also about 3,000 head of stallions castrated. During the year 1928, there were approximately 12,000 head of mares tested, about three per cent of which reacted to the test. There were also about 2,000 head of stallions castrated. We found during this season's work, about one-half the infected territory had been freed from dourine, owing to the systematic work of the year before. This resulted in considerably less work this season, since we had less than half as many hores to handle. During the season of 1929, there were approximately 5,000 head of mares tested, sixtenths of one per cent reacting to the test. Something like six hundred head of stallions were castrated. After going over the territory the first time and the result of tests obtained, retests were made of all that part of the country which showed infection to any great extent.

Within two years the percentage of re-

Indian Trading Post at the Gap, Arizona. The corrals in the center field are filled with horses.

actors has dropped from seven per cent to less than one per cent. Most of the stallions have been castrated as proved by the small colt crop, and since the stallions castrated this year were practically all too young for service, it naturally follows that there has been no further spread of the disease. However, there has been sufficient breeding with nonreacting stallions so as not to destroy the local horse industry. Even with some breeding going on, the percentage of reactors was so small that the chances for further spread of the disease is practically nil. Furthermore, no reactors were found to have open lesions this year, and there is small chance of transmitting the disease from one animal to another in this section unless there are open lesions. Apparently all reacting animals found this year were those which had the disease in the incipient stage last season, and, therefore, did not react to the test at that time. As the ranges have been worked and reworked, time after time, with negative results, it is my belief that it will not be likely to find another reactor in this entire territory. These facts make it seem probable that dourine existent on this reservation for many years has now been eradicated.

A Rare Sequela to Mercuric Iodid Treatment in Equine Epizootic Lymphangitis: Orchitis

By L. M. YUTUC, Los Banos, P. I.

THE subject described in this paper was selected from the animals treated in the hospital of the College of Veterinary Science, University of the Philippines, Los Banos, during the year 1928, because of its unusual termination. In view of the outstanding finding of Nainsouta [1] on the specific curative action of mercuric iodid on the causative agent of epizootic lymphangitis, and the satisfactory results obtained by Kelser [2], it was tried in the latter part of the treatment of the case here reported. In a treatise on epizootic lymphangitis, Pallin [3] also advocated the administration of this drug orally however, instead of the intravenous method as followed by Nainsouta and Kelser.

In the literature referred to by the writer there is no description of a case similar to the one under discussion; it is evident, therefore, that the recording of the unusual condition would be of interest to those dealing with this disease.

Clinical Record

The animal was admitted in the College Hospital July 21, 1928. It was a native horse, male, light bay, about seven years old and weighed about 200 kilograms—440 lbs. The owner claimed that the animal had been ailing for about two months with nodular eruptions on the leg.

The temperature was 38.8 deg. C., pulse 36 and the respiration 16 at the time of examination; these can be considered as normal. The animal was lively and frequently neighed on seeing mares. A thorough examination revealed the following: ulcers and hard and soft abscesses were noted over most of the right anterior leg. The affected limb from the hoof up to the elbow above was markedly enlarged, appearing almost one-third larger than the left leg. Some of the lesions revealed exuberant granulating tissues, showing no tendency to heal. The hair around the individual ulcer and erupted abscess was matted with dried exudate. The size of the lesions ranged from a pea to a fifty-centavo piece. Behind the elbow joint was a cordlike structure of five hard swellings running posteriorly. In the pectorial region was a similar structure of three nodules rather deeply seated. They were circumscribed and the skin over the swellings was movable. Slight pain was evinced by the animal flinching on manipulation of the affected area. The appetite was good. The testicles were also examined but no abnormality determined.

The horse was tested for glanders the following day; the reaction being negative, a microscopic examination of some pus taken from a newly opened ripe nodule, stained with Gram's staining method revealed numerous gentian-violet color, oval-shape bodies, the *Blastomyces farciminosus*,[4] the primary etiological factor of the disease commonly known as epizootic lymphangitis. The animal was then declared a positive case of equine epizootic lymphangitis.

The first line of treatment instituted was the administration of potassium iodid in doses of seven grams given orally for seven consecutive days, to-

[1] Nainsouta, R.: Action specifique du biiodure de mercure contre la lymphangite epizootique. Recuel de Medecine Veterinaire, Paris, 1926, 102, 534-536.

[2] Kelser, R. A.: Mercuric iodid in the treatment of equine epizootic lymphangitis. The Philippine Journal of Science, 1928, 37, 69-73.

[3] Pallin, W. A.: A Treatise on Epizootic Lymphangitis, William Jerkins Co., New York, 1908, XXII—57.

[4] Kelser, R. A.: Manual of Veterinary Bacteriology, The Williams and Wilkins Co., Baltimore, 1927, XI—525.

gether with the local treatment of the disease. The latter consists of cauterization of the ulcers and the newly opened fluctuating nodules with a saturated solution of copper nitrate, the hard nodules being treated with infriction of 30% mercurial ointment. The animal was then rested for a week, continuing the external medication as needed. At the end of a week's rest the doses of potassium iodid were again repeated for a week. This treatment was carried on from July 23 to September 4, a period covering forty-four days; apparently there was no improvement. The lesions were found to have extended to the muzzle and nasal septum of the animal.

Beginning September 11, the animal was given the following prescription:

℞

Hydrargyri iodidi rubri	
Arseni trioxidi .....aa	5 grams
Cupri sulphatis	100 grams
Pulveris glycyrrhizae .	300 grams
Mucilago acaciae .....q. s.	

M. et ft. bolus No. 50

Sig: One ball a day mixed in the feed.

In conjunction with this prescription the regular external treatment was applied, whenever it seemed advisable. The animal was subjected to this line of medication for forty-three days. It showed considerable improvement, few nodules appeared, the leg was greatly reduced in size although some ulcers remained unhealed. The manner of administering was the same as with potassium iodid, that is a period of active medical treatment followed by several days rest.

In this connection it may be stated the routine mentioned above, in the neighboring towns visited by the ambulatory clinic of the college, it was observed that a large number of our epizootic lymphangitis cases recovered.

As there was an apparent slow improvement of the condition of the animal, the intravenous injection of 0.25 gram mercuric iodid suspended in 30cc sterile distilled water was commenced on October 30. This was administered every second day. After the third injection the thick creamy pus from the suppurating lesions was reduced to sero-sanguinous fluid, and healing appeared rapid. The ventral surface of the neck was observed to be enlarged and edematous; it extended to the pendant portion of the chest and was treated accordingly. At the end of the fourth injection, the animal appeared depressed and carried a temperature of 39.8° C. with an impaired appetite, so the giving of medicine was suspended. At this time the scrotum was observed to be enlarged and infiltrated with serum; it fluctuated on palpation. The left testicle (Figure 1) was noted to be firm and larger than the right, and painful when manipulated.

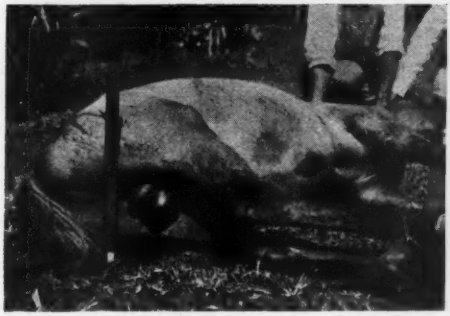


Fig. 1. The animal showing the enlarged testicle.

On November 11, a new nodule was found on the medial aspect of the affected leg just below the knee; it was incised and treated as usual. A microscopic examination of the stained pus smear preparation revealed no blastomyces. The following day the animal appeared lively, apparently normal with improved appetite. November 14, the horse was discharged as the remaining ulcers had healed up nicely, although the left testicle remained firm and considerably larger than the right; also there was a slight inflammation on the neck.

The accompanying illustration was taken about four months after the animal was declared cured. The left testicle was

still indurated, enlarged and painless, but the right was normal.

Summary and Discussion

From the foregoing clinical observations the following may be stated:

1. Potassium iodid as a treatment for epizootic lymphangitis appears to be a failure. This statement is supported by White,[5] and Hutyra and Marek.[5]

2. Oral administration of mercuric iodid together with the usual external medication may be useful in cases of mild affection.

3. The inflammation on the ventral surface of the neck was due to the action of the medicine spilled in the process of administering, while the edema in the pendant portion of the chest was a sequel of the neck inflammation.

4. Orchitis and hydrocele as noted in this animal may in rare cases be a sequel of the treatment. According to the writer's observations, the inflammation of the testicle can be attributed neither to the causes of the inflammation of the testicles as claimed by Dollar[7] nor with those enumerated in a publication[8] of the United States Department of Agriculture. It can be stated, however, with considerable degree of safety, that the mercuric iodid employed remains to be the most plausible etiology, while hydrocele is secondary to orchitis. As to why the right testicle was not involved the writer can advance no opinion.

5. Kelser obtained complete recovery in the average case in not more than two months. The unusually rapid termination of the disease, in this case in a period of fourteen days under intravenous injection of mercuric iodid, may be attributed the previous oral administration of the medicine.

[5] White, David S.: Principles and Practice of Veterinary Medicine, 2nd ed.; Lea and Febriger, Philadelphia & New York, 1920, XVI—531.

[6] Hutyra, F., & Marek, J.: Special Pathology and Therapeutics of the Diseases of Domestic Animals, 2nd ed.; Alexander Eger, Chicago, I, 1920, XVI—1213.

[7] Dollar, Jno. A. W.: Regional Veterinary Surgery and Operative Technique, Alexander Eger, Chicago, 1920, XXXII—1131.

[8] Special Report on Diseases of Horses, Rev. ed.; United States of Agriculture, Bureau of Animal Industry, Govt. Printing Office, Washington, D. C., 1916, 629.

COLLEGE VETERINARIANS TEST 21,125 SPECIMENS

Diagnosing the ailments of 21,125 bird and animal specimens in the hope of finding cures and methods of controlling various maladies was part of the work of the Wisconsin College of Agriculture veterinary science department during the past year.

Contagious abortion blood samples, totaling 17,003, came to the college in the largest numbers. Poultry disease suspects were next in line with 3,502 specimens. Cattle, sheep, swine, horse, pet-stock, and fur-bearing animal specimens totaled 621.

As well as all of this diagnostic work, the department saved Wisconsin farmers a great deal of money by answering their inquiries regarding some few useless stock tonics and mineral feeds that have been tested out at the college.

Specimens for diagnostic examinations come from Wisconsin residents. Some came direct from the stockmen, and some came from veterinarians. The service is chiefly retained for increasing the reliability of the diagnostic work of practicing veterinarians throughout the state. The college veterinarians thus hope to aid the men that are right out in the field by supplying them with all available information that may solve the problems of preventing, curing, and controlling animal diseases and parasites that occur throughout various parts of the state.

Besides determining disease and parasitic ailments, the department, by cooperating with the state toxicologist, annually runs several chemical tests to determine the presence of certain poisons in live stock feeds that might account for occasional deaths.—Univ. of Wisc. *Bulletin.*

Aniline Dyes Bring Negative Reactions in Infectious Abortion

By ARTHUR H. BRYAN, Baltimore, Md.

REACTORS to the compliment fixation test for contagious abortion show up negative following injections of acriflavine intravenously.

While there has been considerable information recently in veterinary literature regarding the merits of the intravenous injections of the isotonic acriflavines and trypacrin solution A, the latter being a solution of gentian violet and neutral acriflavine, specific information is still wanting.

Whenever the dairyman or veterinarian wishes definite information as to whether a herd or individual animal is infected with the *B. abortus* Bang, without regard to whether the animal actually aborts or not, he relies upon laboratory diagnosis via the compliment fixation test or more recently, the agglutination test, which by the rapid plate method, can be done with fair accuracy by the veterinary practitioner.

The true test as to the efficiency of the flavine dye products in abortion disease, lies in tabulated results of reactors to the laboratory diagnostic tests, retested again after inoculation and the results noted. Evidently if an animal reacts, and aborts according to the history of the case, and then following the injection, fails to react to the test, and does not abort any more, some credit must be given to the inoculation treatment, especially if this occurs uniformly in several herds and many individual cases. The following records show results to date of this treatment for infectious abortion.

Herd No. 1. Owner J. E. Owens, West River, Md., a herd of 23 animals, seven reactors to the agglutination test for contagious abortion, and a history of recurring abortions. These animals were all injected intravenously with from 20cc. to 40cc of neutral acriflavine solution. The owner had a chance to sell out his entire herd to E. W. Bassford, at Harwood, Md., who had aborters on his place also. This entire herd was injected with acriflavine, and later tested for abortion. The results were negative for the entire herd (both herds), and there has been no recurrence of contagious abortion as indicated by abortions since.

Herd No. 2. Owned by W. W. Townshend, Davidsonville, Md. Two aborters and two reactors to the compliment fixation test made July 15, 1929, at which time they were injected with the usual acriflavine. August 17, 1929, these two animals were retested and both gave negative reactions.

Case No. 3. Owned by Charles Townshend, Davidsonville, Md. One cow aborted, with retained afterbirth. After removal of the placenta, the placental cotyledons showed dirty yellow discoloration characteristic of aborting cattle. This animal was given a very heavy dose of acriflavine—50ccs., intravenously. She was tested two weeks later and showed negative to the test.

Case No. 5. Owned by J. Marshall, Carney, Md. A cow aborted on September 9, 1929, was injected with acriflavine and September 20, 1929, tested for abortion showing first a partial reaction and 15 days later she was negative to the test.

Herd No. 6. Owned by J. W. Stuart, South River, Md. On July 20, 1929, with a long history of aborting cattle in his herd, all showed negative following the usual intravenous injections of neutral acriflavine.

The tests were made by the state, and are therefore official. Of course, the injections may render the animal only temporarily free from the disease, only time can show the effectiveness of the

treatment in that respect, and presumably, no immunity results from the injection. Theoretically, the acriflavine inhibits the growth of the organisms, and may kill them in the genital tract and udder, just as 606, Neosalvarsan destroys the *Treponema pallidum.* That the aniline dyes do reach the genitalia is proved by the fact that animals slaughtered shortly after intravenous injection show the presence of the dyes in these tissues. From these results we are justified at least in continuing to use these flavines and note the results obtained over a period of years.

It may be of interest to report that I have treated two cholera infected hogs with intraperitoneal injections of these dyes. The hogs which had temperatures of 105° F. and 106° F. and recovered following the injections. I have no conclusions however to report. I just did it and it just occurred. Maybe it will happen again, maybe not.

REMOVAL OF MELANOTIC TUMORS

I am writing you in regard to a grey mare I have been treating with melanotic tumors. She is about sixteen years old and in good health except for these tumors, which are situated around the anus and interfere with defecation. One side swelled up badly and I lanced it. It bled profusely on the start and since has been discharging pigment, but doesn't appear to get much smaller.

Do you find any treatment successful? Is it injurious to other horses, as where she rubs herself on trees some of the other horses seem to lick at this pigmented discharge.

G. A. B.—Man.

Reply: Melanosis is a stubborn and subtle affection.

We sometimes can remove a melanotic tumor when it is not too diffuse and its removal would not destroy essential tissue, but afterward very frequently similar tumors appear elsewhere and, in some cases, in a more vital spot.

In your case, the probabilities are that if you thoroughly dissected the tumor, you might destroy the sphincter of the anus, although it is occasionally possible to operate successfully on one of these tumors involving the anus or rectum, as they so frequently do. I use the word "occasionally" advisably, since in most cases, if you attempt to follow the tumor to its full outline you would probably have to dissect away so much of the rectal wall as to perforate the abdominal cavity, which of course, would be disastrous.

I have known of animals with cases similar to the one you describe that got along pretty well with one or two enemas a day. Unless the tumor is plainly circumscribed, probably that would be the best procedure. J. F. D.

REMOVAL OF ACTINOMYCOTIC TUMORS

What is the least painful treatment for an actinomycotic tumor the size of a cocoanut?—P. J. D., Florida.

Reply: An effective treatment for large actinomycotic tumors, involving soft tissues only, is to make a rather small incision through the skin, say an inch and a half or two inches long and then with a curved bistoury to search out and connect with this opening all the recesses of the abscess. Evacuate the contents as completely as possible with the fingers and then pack with cotton into which has been worked all the powdered bichlorid of mercury that will hang to the cotton fibers. Use a long dressing forceps for the packing and pack the bichlorid impregnated cotton well back into all the recesses; remove it after 48 hours. In about five to seven days after removing the cotton, the entire fibrous wall will be separated from the normal tissue, and can be removed entire by increasing the size of the external opening, or preferably by cutting into pieces and removing a piece at a time through the small opening. The operation causes very little pain.

Ethical Publicity for Veterinarians

By W. B. CHAPMAN, Powersville, Missouri

THIS is truly an advertising age. Practically all commercial enterprises which have attained success in their respective lines, attribute their success, in part at least, to continuous and persistent advertising in one way or another. The public is desirous of obtaining information concerning the commodities and service they wish to purchase and this information is derived largely from advertising material made available by these several enterprises.

There is no longer any doubt but that advertising pays big dividends in commercial lines and the veterinary profession is no exception to the rule. It is true that we as a profession have certain ethics to follow and uphold, so in order that a breach of these may not occur we must resort to an indirect form of advertising, which may be carried on by publicity campaigns.

One of the latter methods which may be used to advantage is by constantly reminding the public of the responsible position held by the present day veterinarian, both to the live stock raiser and to mankind as a whole. To the former by insuring larger financial returns for his live stock and to the latter in helping prevent the spread of diseases communicable from animal to man.

Several of the veterinary associations are rendering valuable services to the profession by their publicity programs. In the writer's opinion this means of enlightening the public does a great deal of good for the profession as a whole and if persistently indulged in will be the means of raising the profession to a higher plane, a status it rightfully deserves; but to reach the peak of efficiency and retain that position, publicity must be continued indefinitely. We are dealing with a forgetful public and unless the good work is kept up its influence will soon wane.

Regarding individual publicity the practitioner can carry on a program of his own by keeping his name before his clientele as much as possible. This may be accomplished by labeling all medicines he dispenses with name, address, telephone number, etc. This may seem insignificant to some veterinarians but nevertheless if the practice is persistently adhered to it forms a very excellent means of advertising.

Other means of indirect advertising are articles for the local paper, discussing the prevailing diseases of animals in the community. Occasional circular letters calling attention to proper feeds, hygiene and other conditions affecting live stock which may be of interest and help to clients is a very good form of publicity that does not violate professional ethics.

At the present writing there are several laboratories and supply houses doing the graduate veterinarian a great favor by recommending to the live stock raiser the advantages of securing the services of the graduate. This endeavor on the part of these commercial houses is worthy of comment and should be keenly appreciated by the practitioner. There is no better way of showing appreciation than that of patronizing the concerns responsible for the movement.

Another and important role bearing on the subject of publicity, is the personal conduct and activities of the veterinarian himself. He should take an active part in the affairs of the community. Being a "back number" is a poor advertisement. Respect and prestige (and incidentally publicity) may be attained by boosting every worthy enterprise that comes along.

In closing I wish to say that I do not believe that any of the above brief suggestions are in violation of the present code of ethics but if they are I would suggest that the present code of ethics

affecting the veterinary profession be revised to meet the modern trend of times. The nostrum industries are conducting nation-wide advertising programs and in a great many instances misleading the live stock raiser by their unscrupulous methods. Therefore, to combat these practices and enlighten the public, it is imperative that the veterinary profession carry on with their publicity programs. If this cannot be accomplished under our present code of ethics let us change our code to meet existing conditions.

PARAPLEGIA IN A DOG SUCCESSFULLY TREATED

A dog was brought to my hospital August 24th, with complete paralysis of the hind legs. The condition had developed gradually and for several days the sphinc-

ter of the bladder had been paralyzed so that urine dripped continuously. This dog remained under treatment four weeks and was discharged practically well on September 21st.

The treatment given was violet rays, massage, heavy feeding with mineral yeast and exercise in the cart shown in the illustration twice daily for periods of one-half hour each. In addition to the abdominal support, the dog has his hind feet in a pair of baby shoes fastened to the axel of the cart.

Granville, N. Y. Chas. T. Fake.

HORSES AND MILKWORT

Dr. F. M. McConnel of Litchfield, Michigan, sent to me the following letter and a specimen of Milkwort.

This plant was taken from a clover and timothy pasture on upland, quite free from weeds and other foul matter, and was first noticed about one year ago, when several horses were afflicted with symptoms of forage poisoning, not all were taken at one time but came down with trouble at times, extending over a period of about a month. None of the cases have been fatal. No other animals except horses run on this pasture. This plant may not have anything to do with the trouble, but we would like to know if it is poisonous.

This weed, known to botanists as *Polygola sanguinea,* is related to Seneca snakeroot, which is known to be slightly toxic. The Seneca snakeroot contains a saponaceous substance. Animals eating it have a frothing condition of the mouth. This probably is true of the common milkwort sent us. In the Seneca snakeroot, when poisoning occurs, there is an enlargement at the root of the tongue. —L. H. Pammel.

NOTES ON FRIGHT DISEASE

A little addendum to history, etc., in hyperkinesia.

A mongrel female hyperkinetic gave birth to a healthy litter of pups. These remained absolutely healthy until six weeks old, when the dogs were sold. Incubation seldom lasts longer than one week here.

A good way to test the dog as to whether he is free from this disease, is to take him out on a hunt two or three months after the last paroxysm. Some dogs never get rid of this trouble or perhaps become reinfected. One bull dog, sound for a year or two, did develop this disease, an exception perhaps.—Fla.

Office Appearance and Equipment—The Psychology Thereof

By CARLTON CLEVELAND, Highland Park, Ill.

WE ARE living in an age when everything likely to come in contact with human beings is brought up to a higher standard. Time was, and that not so long ago, when the veterinarian held forth in some barn or back-lot shed. That was back in the days when animal horsepower had not yet been shoved to the background—before the phenomenal advance of the automobile, the tractor, and the airplane. In those days almost every livery-stable displayed the gold-lettered sign of the veterinarian who practiced in that immediate community. The treatment of horses formed a large part of the practice of those veterinarians who lived in the residential sections of large cities. In the country the honors were divided among horses, cattle, hogs, and other farm stock.

Today all has changed, particularly in the metropolitan and suburban residential sections. Here the veterinary practice consists almost entirely of the treatment of ills and accidents that befall the household pet—the dog, the cat, and the bird.

The veterinarian, like the physician, is called to the home to see the animal, or else the animal is brought to the office in the family car. Because these animals are generally brought to the veterinarian by their mistresses, it is important that the premises show an inviting appearance. Women are quick to observe untidy or unkempt surroundings.

Office location and furnishings may, therefore, be considered factors as vital to the present-day veterinarian as to the physician and dentist. An ideal location would be a building especially built for this purpose, but if this is not to be thought of, then a first-class store, properly fitted up, may be considered a suitable place. A small space should be partitioned off to be used as a reception room. This can be made cozy and homey and kept orderly and neat, so that the first impression the visitor gains on entering the front door will be favorable.

The same idea of neatness and pleasing appearance should be followed throughout. The surgery and examination room should be equipped with the best the practitioner can afford, consistent with the amount of business to be expected from the community. People can't help but be impressed, either favorably or unfavorably, by the style and type of equipment they see and by the general cleanliness and neatness of the place.

The operating-room equipment for the veterinarian is similar to that commonly seen in the offices of physicians. People are therefore somewhat familiar with such accouterment and are in a position to appreciate an office fitted with modern furnishings.

The cages for the animal patients should be roomy; and neatness and cleanliness should be the keynote at all times. Newspapers used on the floor of the cages soon become torn and soiled. These may be changed quickly and the trouble involved is amply paid for by the improved appearance.

The surgery should be kept spick and span and cleaned thoroughly after each operation. Bloody instruments, gauze, cotton, towels, and other articles should not be left lying around where they may be observed to the disgust or horror of some timid mistress who may step in unexpectedly with her Chow or Angora.

Strong odors of drugs are offensive to those unaccustomed to such smells, and, although it is necessary to use disinfectants, the rooms may be thoroughly aired after their use, or a pleasant deodorant may be sprayed about the premises occasionally. Such spraying will also be found helpful in

concealing animal odors which are sometimes prevalent. A satisfactory and very simple way to deodorize a room is by burning Japanese, Egyptian, or India incense, obtained at any drug store.

These are just a few of the things the veterinarian will do well to think of. Professional ability is the first consideration, of course, but after that, attention to detail in the matter of surroundings will go a long way toward spelling success for the veterinary practitioner.

A NEW LOCAL ANESTHETIC

A new anesthetic which puts patients to sleep so pleasantly and easily that they ask for more has been reported by Dr. J. S. Lundy, of the Mayo Clinic, and Dr. R. M. Isenberger, professor of pharmacology of the University of Kansas. Fewer unpleasant after-effects and far less danger than many of the local anesthetics are claimed for this new aid to surgery, which has the name of iso-amylethyl barbituric acid.

The work grew out of the old problem of how to offset the bad effects of some local anesthetics. Many investigators have sought means of avoiding the occasional cases of poisoning by cocain. Accordingly, procain, a synthetic product, was developed as a substitute for cocain. However, bad reactions occasionally follow even the use of procain. Drs. Isenberger and Lundy, following along the line of some previous workers, found that certain subsitution products of barbituric acid gave protection against convulsions from procain. They reported their work with iso-amylethyl barbituric acid about a year ago.

In the course of a year's further work, Dr. Lundy has used iso-amylethyl barbituric acid, experimentally, and for the benefit of patients, over a thousand times. He has given it by mouth before administering local anesthesia and the apprehension from which some patients suffer before an operation has been lessened in this way. Moreover, convulsions, that occasionally come on from the use of procain, have not appeared in any cases in which iso-amylethyl barbituric acid has been used—*Science.*

DIAGNOSIS OF NECROTIC ENTERITIS OF SWINE

Is there any practical method of diagnosing necrotic enteritis in apparently healthy hogs? I have a herd in which we had a 20% loss; all noticeably affected swine were isolated, those recovering were marked so they could be identified later. At present, they are as thrifty a bunch of hogs as any I have ever seen.

The owner wishes to weed out the carriers, if any, of necrotic enteritis, breed the sows and move them to clean quarters.—H. S. L., Iowa.

Reply: You have asked a question that is extremely difficult to answer. That is, the method by which the mild form of necrotic enteritis may be positively diagnosed.

Necrotic enteritis in swine is a very variable malady so far as severity of an attack is concerned.

In the most acute cases of this disease there is an acute inflammation of the bowel and the animal dies promptly. In the subacute type, there is general unthriftiness, usually diarrhea, the appetite remains about normal but the hogs gradually become lighter in spite of the fact that they may be fed a balanced ration and eat heartily.

In a less severe form of this disease, there is usually no evidence of the malady in the affected individuals, however as a rule, if the entire herd is carefully examined and a detailed history is obtained, it will be found that there have at least been some few pigs in the lot that were unthrifty and have suffered from diarrhea, although those particular individuals may have died or apparently recovered.

Where such a history is obtained or where one observes this type of individual, then it is plausible to assume that there is some enteric disorder and it is usually not advisable to treat such animals with serum and virus.—A. T. K.

Pulmonary Edema of Cattle

By J. D. RAY, Kansas City, Missouri

THE name pulmonary edema has been applied to a condition in cattle associated with so-called diphtheroid infections (or infections due to varieties of corynebacteria), and characterized by edema of the lung. This has become a relatively common condition in cattle in many parts of the United States. It appears at all seasons of the year. All classes of cattle become affected. Young stock are most susceptible. Cattle recently shipped are especially prone to develop the disease. Native stock also commonly develop the disease. Native calves frequently develop the subacute or chronic type.

Clinical Manifestations

The principal symptoms manifested at its onset, as a result of the involvement of the lungs, consist of a shallow dry cough and dyspnea. The elevation of temperature may or may not be marked. Exercise aggravates the dyspnea. Animals may collapse if forced to exercise. The word "pumper" fittingly describes the breathing. In the subacute and chronic forms, there is evidence of solidification in the lungs, emaciation and later diarrhea may develop. Most such cases ultimately die.

Post Mortem Findings

The lesions are primarily confined to the thoracic cavity, and consist of an edema of the lung and frequently an extensive hemorrhagic condition of the heart coverings and other tissues, apparently due to rupture of capillaries. These hemorrhages are practically the same as those observed in cases of hemorrhagic septicemia.

An affected lung, when observed in the initial stages, has a peculiar grayish color, does not collapse and has a doughy or rubbery resistance. In fatal cases, practically the entire lung is involved. The lung lobules will be well outlined by the edematous fluid that has accumulated in the interlobular spaces. (Emphysema may be present in the lung tissue, due to the interference of normal respiration.)

If such a lung is sectioned the pleura will be thick and quantities of edematous fluid can be expressed. Some practitioners describe such a lung as "soggy." In those cases that survive for several days the edematous fluid will gravitate into the dependent portion of the lung. This leaves the dorsal part practically normal and the lower areas solidified.

In subacute cases the pulmonary edema is followed by necrosis, in which there may or may not be abscess formation, particularly in the dependent lobes of the lung. Uncomplicated cases never show the usual inflammatory processes, commonly found in other disease processes.

The course of the disease is variable. Some animals apparently have sufficient resistance to overcome the infection and after having had a hacking cough and accelerated breathing for several days, apparently entirely recover. Most cases that show distressed breathing will die unless treated promptly. There is a marked shrinkage during an attack of the disease. The animals may die, apparently of asphyxia, within two or three days after the onset.

Differential Diagnosis

It is usually necessary to make a bacteriologic examination of specimens to learn the exact organisms present. In acute cases where death occurs from septicemia before extensive lung lesions develop, the gross hemorrhages can not be differentiated from hemorrhagic septicemia. Subacute and chronic cases tend to become complicated. In such cases lesions will be mixed and inflammatory processes usually develop.

Cottonseed meal poisoning has been

mentioned as a possible condition to be differentiated.

Parasitic pneumonia frequently is complicated with this infection.

Prevention and Treatment

Pulmonary edema, as described, can best be prevented by observing strict sanitary measures and the use of a properly prepared bacterin.

In treating individual cases showing dyspnea absolute quiet is essential. Specific bacterin therapy with proper care has given best results in treatment of affected animals.

Some practitioners recommend camphorated oil or some respiratory stimulant in conjunction with bacterin.

Treatment is of little avail after necrosis and abscess formation takes place in the affected lung tissues.

ETHER BELOW STANDARD SEIZED BY OFFICIALS

Seizure of 557 pounds of anesthetic ether which does not meet the requirements of the U. S. Pharmacopoeia was made by Federal officers recently, according to officials of the Food, Drug, and Insecticide Administration, U. S. Department of Agriculture. The ether contains peroxide which is not allowed by the standard.

Of this substandard ether labeled to indicate that it was intended for anesthetic use, 280 one-fourth pound cans were seized in San Francisco; 15 one-pound tins at Kansas City; 20 one-pound tins at Seattle; 40 one-pound, 180 one-half pound and 90 one-fourth pound cans at Hoboken; 500 one-half pound cans at Minneapolis; and 100 one-half pound cans at Chicago.

A short time previous to this 319 pounds of anesthetic ether at Boston and Providence was found by the Administration to be substandard and seized.

FOCAL NECROSIS ON COW'S UDDER

I have been having considerable trouble with necrotic sores between the halves of cow's udders. This appears to be a skin condition and occasionally spreads to other portions of the udder, not involving the tests, and has a very offensive odor.

Could you give me any information or a treatment for the condition?

I also have a necrotic condition in the prepuce of steers with which I have been unable to get desired results from medication. Would appreciate any suggestions here also. —H. S. L., Iowa.

Reply: I am quite convinced that the preputial sore is due to *B. necrophorous.* I am not certain that the lesions on the cow has the same source, but if these animals occur on the same premises, then I would be inclined to think the udder lesions are due to the same cause. Such cases usually respond fairly well to treatment with tincture of iodin, or some other agent applied locally after having curetted away the necrotic tissue. See Ano-Vulvitis and Posthitis in Cattle, in the November issue of VETERINARY MEDICINE, page 493.

ABORTION REQUIREMENTS FOR INTERSTATE SHIPMENT

The following states now require that imported dairy or breeding cattle pass a negative blood test for the abortion disease: Alabama, Arkansas, Georgia, Indiana, Iowa, Mississippi, North Carolina, South Carolina and West Virginia.

And the following states have laws or regulations prohibiting the importation of reactors or suspects to the abortion blood test except for immediate slaughter, or subject to quarantine: Minnesota, New Jersey, North Dakota, South Dakota.

In addition, the Wisconsin regulations require that the prospective seller advise the prospective buyer of any blood test reactions in the herd from which come the cattle that are being shipped.—*Michigan Veterinary News.*

Why Plants are Poisonous

By L. H. PAMMEL, Ames, Iowa

"The Chemistry of the Formation of Poisons in Plants" is the title of a most interesting paper by Lieutenant Robert E. Sadtler.[1]

It is a well known fact that certain species of plants are toxic in some localities and not in others. As an illustration: The Loco, which occurs in Western Iowa, is not toxic, or at least does not produce Loco poisoning, whereas the same plant grown in the Rocky Mountain region produces loco poisoning. Also, it is a well known fact that in certain stages of development of plants the toxin is abundant, as for instance, the hydrocyanic acid in sycamore leaves when the plant is young.

During the early growing season I found evidences of toxicity in cowbane. "Experimental work has shown that some plants are less toxic in summer than they are in fall, winter and spring. Plants which illustrate this principle are cowbane, *Cicuta maculata,* and musquash-root, *Cicuta vagans.* The fact has also been definitely established that plants lose much of their toxicity as they approach the flowering stage. The largest amount of acrid toxic substance is concentrated in the plant in spring. This has been shown by experiments with the opium plant and larkspur. However, there are some plants such as the mountain laurel which are most toxic in winter."

Doctor Sadtler also states: "For example, hydrocyanic acid is regarded as the first product of nitrogen assimilation in the plant. These poisons also have a marked protective function to the plant. Many poisons occur in the insoluble form in the cellsap, as morphin, atropin, digitalin, veratrin and muscarin, without injury to the plant. The physiological effect of the various poisons upon different species of plants is variable, due to the variations in the constituency of the protoplasm of the plants. An alkaloid may act as a stimulant upon one plant and have a distinct toxic effect upon another plant of different species.

Again, it is a rather interesting fact that the toxic substance may occur only in the seed. "The toxic substance may occur only in the seed of the plant, and after germination the poison may be decomposed. In certain other plants, the earlier stages are nontoxic, but when it reaches maturity the poison is formed in the latex. This is the usual process in the formation of narcotic substances. In other cases, the poison is formed by the reaction due to the contact between two different tissues or parts of the same plant. Hydrocyanic acid is formed in this manner from the glucoside, amygdalin, by contact with an enzyme emulsion. Amygdalin occurs in the leaves of the cherry-laurel, and in the bitter almond.

Again, poisons are not confined to any one part of a plant. They occur in the stem, flower, root, fruit or seed. Lieutenant Sadtler says: "The poison may be found in many different parts of the plant, as the stem, flowers, root, fruit, leaves or seed. Usually the poison found in aerial parts of plants is more transient than poison found in stem or roots. In certain cases, only the subterranean part of the plant is poisonous, as in the common European violet. Or the poison may be produced solely by the action of light, upon the subterranean part of the plant. An illustration of this is the green tuber of the potato.

Furthermore, climate has a significant influence upon the poisons produced. Lieutenant Sadtler says: "Climate has a significant influence upon plants, for example, cherry-laurel and aconite, which are poisonous in temperate regions, lose their toxicity when taken into colder regions. More poisonous species of plants are found in tropical

[1] Scientific Monthly, October, 1929.

regions than in colder zones, largely because of the heat and humidity.

"The relative humidity of climatic zones affects the quantity and quality of vegetable poisons produced in the plant. Dry climates produce a greater amount of glucoside which can be converted into hydrocyanic acid (by hydrolysis) than moist regions. For example, the amount of alkaloid in the cola-nut varies with the climatic zone. The superior quality of certain kinds of opium is attributed to climatic conditions. These conditions also affect the amount of nicotin found in tobacco. The percentage of nicotin in tobacco varies from 0.5% to 8.8%, largely dependent upon soil and climatic conditions. Other chemical products of plants vary with climatic conditions also to a considerable degree.

Some poisons are widely distributed in different types of plants and Lieutenant Sadtler refers to the substance Saponin as follows:

"There is also a wide distribution of toxic substances in plants that are not phylogenetically related. The irritant, glucoside poison, saponin ($C_{32}H_{54}P_{18}$), occurs in many different plants with widely varying botanical characteristics as quillaia and soapwort."

EQUINE PERNICIOUS ANEMIA

Swamp fever, equine pernicious anemia, was quite prevalent in Southwestern Missouri and Southeastern Kansas during August and September. This malady has prevailed in the above mentioned area for the past several years. There were more cases and the disease was apparently more fatal during 1929 than previously.

Symptomatically an acute attack of swamp fever is characterized in the beginning by high temperature, lassitude, hemorrhages into the ocular mucosa, and there may or may not be colicky pains. As the disease progresses there is usually a marked relaxation of the sphincter ani, jugular pulse, yellowish gray discoloration of mucous membranes, emaciation and incoordination. The animal may apparently recover, the temperature becoming normal, but such cases are usually unthrifty and sooner or later there is a relapse.

The lesions found in those cases that die of an acute attack, consist of anemia and there may be edema along the lower parts of the body. The heart and spleen are usually enlarged and there is usually sub-epicardial and peri-cardial hemorrhages. Lymph glands of the abdominal viscera are usually tumefied. In the chronic cases there will be extreme emaciation, and marked edema in addition to the lesions observed in acute fatal cases.

The diagnosis of this malady is not difficult. However, it may be confounded with intestinal strongylosis. The high temperature and hemorrhages into the ocular mucosa should be sufficient upon which a positive diagnosis can be made. Practically all horses and mules affected with swamp fever harbor strongyles. In fact, nearly all equines are affected with parasites and they may be a predisposing factor, but are not the active cause of swamp fever.

Recently Oppermann and Lauterbach have devised a method for the positive antemortem diagnosis of swamp fever in horses. They have found that the injection of blood serum from a normal horse into the muscle of a chicken produces no reaction but if the blood serum from a horse affected with swamp fever is injected intramuscularly into a chicken in seven days there will be a round cell infiltration and a deposit of hemosiderin in the liver.

Treatment of swamp fever is not very satisfactory. The use of arsenical preparation either as Fowlers solution or the special intravenous products, combined with symtomatic treatment apparently gives best results. It is possible that small doses of copper sulphate would be of value.

Kansas City, Mo. A. T. Kinsley.

The Transmission of Tuberculosis*

A. F. SCHALK, Fargo, N. Dak.

TUBERCULOSIS is primarily a disease of civilization, of man and domestication of animals.

Consumption and phthisis of the human race have existed almost since the dawn of civilization. Pearl disease of cattle has been recognized for centuries, but "spotted livers" and nodular intestines of fowls under domestication have been known for only a comparatively short period of time. However, it is now quite definitely acknowledged that all of these disease conditions are simply manifestations of the various types of tuberculosis.

It remained for the birth of that wonderful science—bacteriology, accompanied with its newer methods of study, and improved instruments and equipment to make the foregoing knowledge and subsequent facts pertaining to the disease possible.

The more important and economic phases of tuberculosis have been learned since the middle of the last century. In 1865 Villemin proved the transmissibility of the disease from man and cattle to experimental animals, thus establishing its infectious nature. In 1868 he made the statement "that the phthisical soldier is as dangerous to his mess-mate as a glandered horse is to its team." A few years later in 1882 Robert Koch, with the aid of newly devised staining methods discovered the tuberculosis organism and in 1891 he gave to the world the first tuberculin, a product absolutely indispensable for the present day diagnosis of the disease in animals."

It was soon learned that the mycobacterium tuberculosis organism, the tubercle bacillus, is not a single strain germ, but one which manifests itself in three quite distinct types as it affects the various species of animals including man and fowls. These are the human, bovine and avian types of tuberculosis.

Consequently the question of considerable importance confronts us as to how we can definitely determine the three distinct types of the organism and to what extent they are involved or instrumental in the production of the disease in the different animal hosts. With the initiation of the nation-wide tuberculosis eradication campaign in 1917, need for the fullest possible knowledge of these phases of the disease became at once quite evident, for a successful culmination of this movement, the greatest sanitary project of all time.

While in a few limited cases one can successfully differentiate the various types of tuberculosis by cultural and staining methods, on the whole these methods are entirely inadequate for reliable results. On the other hand, the experimental animal typing plan is quite dependable and represents the best known present day method of determining to what type a given organism belongs. The rabbit, cavia or guinea pig, and common fowl are used in this method and their infectivity to the various bacillary types of tuberculosis are charted below:

Bacillary Type	*Cavia*	*Rabbit*	*Fowl*
Bovine	***	***	0
Human	***	*	0
Avian	0	***	***

Legend *** readily infected
* slightly infected
0 non-susceptible

Unfortunately, however, there appears to be some intermediate, or possibly transitional and aberrant types that cannot be accurately placed by this method.

The human type is particularly confined to man, the various monkeys, parrots, occasionally swine, about 50 per cent of the tuberculosis in dogs, and many wild animals in captivity.

With reference to the bovine type of organism, our present knowledge holds it accountable for practically all tuberculosis in its natural host, the bovines as well as in the goat and cat. Practically all generalized

* Excerpts from a discussion before the Eighth Annual Conference of Kansas veterinarians held at the State Agricultural College, Manhattan, Kansas, February 6 and 7, 1929.

tuberculosis in swine is traceable to the bovine strain. About 50 per cent of dog tuberculosis is of bovine origin and likewise some tuberculosis in the horse is of the same source. The most vital question, however, is to what extent is this type involved in tuberculosis in the human family?

Robert Koch, the discoverer of the tuberculosis organism, made the statement at the International Tuberculosis Congress in London in 1901, that "bovine tuberculosis is not transmissible to man." Although this statement set the medical world back about 20 years on this question, the facts of the case are rapidly coming out and most valuable data has been gathered on the problem during the last decade. Statistics gathered by investigators in many lands show conclusively that the infection of man by the bovine strain of the tubercle bacillus is quite common in many places, particularly in the juvenile period of life. Figures obtained from a large number of hospitals throughout the country as well as in foreign countries in children under five years of age where milk is an important element of the rations, that from 4 per cent to 70 per cent of all cases of tuberculosis are of bovine origin. These data are furnished by and confirmed by such authorities as Park of New York, Rosenau of Harvard Medical School, Chesley of Minnesota and Griffeth of the Royal British Tuberculosis Commission, and many others. Fortunately, however, it is usually confined to localized glandular tuberculosis. Nevertheless, it is tuberculosis and constitutes a very serious phase of the Tuberculosis Problem with which we are confronted at this time.

Avian tuberculosis is the youngest recognized member of the tuberculosis family, having been brought to our attention but little more than a half century ago. However, it has attracted considerable attention and has been the subject of many experimental studies that have proved fruitful in discoveries.

The Avian strain of the germ is the cause of practically all tuberculosis in our common barnyard fowl, turkeys and guinea fowl and the most of the tuberculosis of the wild fowl of field and forest when kept in confinement. Water fowl are apparently relatively immune to tuberculosis as it is not a problem in that class of fowl. Next in point of susceptibility and infection is the hog. Avian tuberculosis of a localized nature is exceedingly common in swine in some sections of the country where it appears to run quite parallel to the infection in fowl. Cattle are readily susceptible to the extent of sensitization, which rarely results in visible lesion infection. The only two cases of tuberculosis observed by the writer in sheep were of the avian type.

Rather extensive experimentation with the transmission of avian tuberculosis to other classes of animals at the North Dakota Experiment Station have resulted in some very interesting data. Swine, especially pigs from 4 to 8 or 10 weeks of age take the avian disease readily and with but slight provocation. If the carcass or organs of a chicken with generalized tuberculosis is fed to a litter of 8 pigs of this age in a single feed, one can reasonably expect 6 of them to become infected with the disease. Similarly, approximately the same percentage of such animals will contract avian tuberculosis if placed in a pen where they can eat the droppings from a half dozen diseased birds for a few weeks or when cohabitating in a closed barnyard with tuberculous chickens. In some respects young pigs seem to be as satisfactory for experimental purposes for avian tuberculosis as the fowl themselves. However, the infection is usually confined to the pharyngeal and mesenteric lymph nodes and rarely if ever generalized.

Thirty cases of localized tuberculosis in swine obtained from the Northern Packing Co. of Grand Forks, North Dakota, in the summer and fall of 1923, typed out 88.5 per cent avian tuberculosis. This percentage coincides exactly with that from the Nebraska Station covering 208 cases during that and the following year. These findings clearly show why large numbers of hogs emanating from tuberculosis free areas for cattle, are affected with localized tuberculosis. It is a problem of considerable economic significance, which calls for the eradi-

cation of tuberculosis in our farm poultry.

Young cattle cohabitating in our experimental barnyard with tuberculous chickens from June 1 to November 1 readily become sensitized to avian tuberculosis (about 80 per cent of the cattle). These sensitized animals react positively to avian tuberculin but invariably fail to react to mammalian tuberculins. This would indicate that the veterinarian in the field using mammalian tuberculins is not obtaining positive reactors that have been sensitized or infected with the avian type of the organism. Some veterinarians engaged in field testing have been erroneously telling their clients that their cattle are contracting tuberculosis from the diseased chickens on the farm. *The checked experiments do not bear out this statement.*

If the cattle reacting positively to avian tuberculin are slaughtered and autopsy held, a negligible percentage of them will show visible lesions. The relatively few that do show lesion infection, manifest very limited lesions localized in the pharyngeal and mesenteric lymph nodes.

On the other hand, if the sensitized animals are removed from the exposure from cohabitation, the sensitization is apparently of a temporary duration, usually fading out completely in the course of a few months.

Some of the animals in which the sensitization had faded out were exposed and became resensitized a second and third year when again the sensitization died out. The cattle which had been sensitized for three successive years were then autopsied and no evidence whatsoever of visible lesion infection could be detected by the most searching inspection methods.

Realizing from our tuberculosis barnyard experiments that cattle could be readily sensitized by avian tuberculosis, we attempted to learn if possible the minimal dosage of tuberculosis virus (germs) that would produce a state of sensitization or allergy. Experiments to date show that cattle can be sensitized by instilling the germs into the conjunctival sac or rubbing them into the scarified skin with dosages as small as .0001 and .00001 mg. of the pure culture. This virtually means that cattle can be sensitized upon extremely slight provocation. In all probability animals with breaks and abrasions in the skin lying down upon droppings from tuberculous birds, or receiving the powdered droppings from such birds into the conjunctival sac may become sensitized so that they will react positively to the tuberculin test.

Wishing to ascertain to what extent avian sensitization existed in stockyard run cattle, arrangements were made with the Armour Packing Co. of West Fargo, North Dakota, to test all the left over young cattle at their yards. During the summer and early fall of 1927 more than 500 short to long yearling cattle were given the intradermic test using both avian and mammalian tuberculins. The record sheets revealed the interesting fact that 15.5 per cent responded positively to the avian tuberculin while less than 0.5 per cent were positive to the mammalian (bovine) product.

Fully realizing the extent and great prevalence of the avian infection in fowls in many sections of the country, the question of distribution, the carrier problem and possible intermediate hosts and depots or reser-

A Positive Reaction.

voirs outside of the infected bird naturally presents itself. In this connection pigeons, sparrows, common rats, barn mice and field mice come in for serious consideration.

Returning to our experimental tuberculosis barnyard, where large flocks of pigeons and sparrows were cohabitating with tuberculous chickens from June to November for four years it developed that we did not succeed in increasing the percentage of avian infection in these pestiferous birds under strict confinement with the diseased chickens. However, both are susceptible to avian tuberculosis and the disease can be experimentally induced in them by feeding tuberculous material and inoculating them with the avian virus. Nevertheless they enter into the carrier problem in a mechanical way through their feet, feathers, or possibly by carrying tuberculosis material in a viable condition through their alimentary tract. In carefully controlled experiments we did not experience any particular difficulties in demonstrating that both pigeons and sparrows carried the disease from the infected to healthy flocks.

Evidently common rats, barn mice and field mice are not very susceptible to avian tuberculosis. We fed large numbers of these animals from time to time with great amounts of avian tuberculosis material, both organs and cultures, over long periods of time without inducing a single case of the disease. Also, we have had large numbers of rats cohabitating with tuberculous chickens, from birth to death, without any of the rats becoming infected. Further, we inoculated numbers of rats subcutaneously, intra-peritoneally and some intracardially with the virulent pure cultures without success.

Like the pigeon and sparrow the rat has proved to be a most potent mechanical spreader of avian tuberculosis. We never failed to transmit the infection from diseased fowls to healthy chickens and pigs in separated box stalls, with rats going from one stall to the other. In these experiments, we could not determine if the rats carried the infection on the exterior of their bodies or through the alimentary tract. Subsequent studies, however, in which all conditions were carefully checked, demonstrated beyond a doubt that the rat carries the avian tuberculosis germs through its alimentary tract in a viable condition, as evidenced by feeding the rat feces to healthy birds which resulted in infection.

Avian tuberculosis is not a problem in young birds. The eggs from diseased hens show less than 1% infection and the baby chicks are rarely if ever hatched with the disease. However, eggs artificially inoculated with fairly large dosages of the pure culture germs, hatch a relatively large percentage of tuberculosis chicks. The young birds can be kept continuously under the most pronounced cohabitation exposure with large numbers of tuberculous fowls and their contaminated droppings from baby chicks to five or six months of age and they rarely if ever attain 1% infection. However, beyond this age they contract the disease quite readily, depending largely upon the conditions of confinement, and the extent and degree of exposure. We have every reason to believe that chickens one year old are equally susceptible as those 2 years old or older.

Our soil studies in connection with avian tuberculosis have been very interesting and enlightening. We have demonstrated for four consecutive years that the organism may retain its viability throughout our fall, winter and spring seasons. An average of 72 tuberculous chickens were maintained in our tuberculosis barnyard during the late spring, summer and early fall. About November 1 all were removed and the yard locked until May of the following year when a number of healthy non-reacting chickens and young pigs were placed in the yard from 45 days to 2 months. Some of the normal birds and pigs contracted avian tuberculosis each year as shown by positive tuberculin reactions and visible lesions upon subsequent autopsies.

Having learned to our satisfaction that the tuberculosis germs survived the rigors of our northern winters in a viable condition, it became advisable to determine how they would endure the summer weather.

Consequently, the contaminated barnyard was cleared of the diseased birds November 1, 1927 and left unoccupied until August 20, 1928, when normal non-reacting chickens and pigs were placed therein, until about November 15, 1928. Some of the chickens contracted the disease but up to the present time the pigs have reacted negatively. An Experimental Poultry Yard under same conditions which was checked with normal chickens only also produced tuberculosis birds. These experiments clearly indicate that the direct rays of the summer sunlight cannot be expected to destroy all of the avian germs in the ordinary barnyard.

In order to gain further knowledge of the possible longevity of the organisms in the soil we buried a large number of tuberculous fowl carcasses, some of the diseased organs and pure cultures of the germ at depths ranging from 1 inch to 3 feet. Although this experiment is not completed it may be stated that we have been able to recover the organisms in a viable state from some of these burials after 17 months. These results give us some idea of the organism's resistance to nature's elements, and suggests quite vividly some of the difficulties we encounter to eradicate the disease from infected farm flocks.

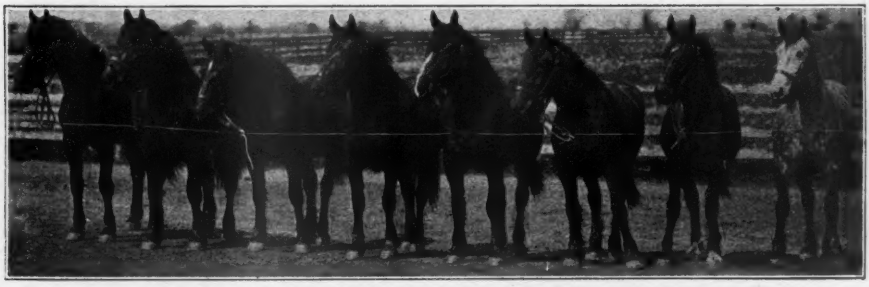
Lastly, we may inquire into possible susceptibility of the human race to the avian type of the organism. Data upon the question are exceedingly meagre and limited. While we occasionally see reports in the press of avian tuberculosis in man, authoritative, scientific confirmation of such cases are usually lacking. The Nebraska experiments now in progress along this line are truly worthy and enlightening. As we gather from them they have typed more than 100 cases of localized and surgical tuberculosis in man and not a single case has proved to be of the avian type. These findings point very strongly towards this disease not being a problem in the human family.

A HORSE TRADERS' CONVENTION

We are not inclined to hark back to "the good old days" but we would like to see one of the old time "hoss traders," who contributed more or less to the joy of living, and sometimes considerable sorrow. The automobile appears to have chased him off the earth and he has probably gone where all good horse traders go—if there ever were any good ones. Down in Connecticut, where we formerly lived, they used to have an annual "Horse Traders' Convention" at Liberty Hill. One could get plenty of horse experience there if you wanted to trade. Unfortunately a misguided humane society stopped this important commercial affair. We hope readers will contribute some horse-swapping stories to VETERINARY MEDICINE. Practitioners of those times were frequently confidents of traders who "got stung." Tell us about them.

North Chicago, Ill. N. S. Mayo.

The veterinarian is the key stone in the arch which supports the livestock industry. Without the livestock industry agriculture could not succeed and the country at large depends on agriculture.—R. A. Pearson, President, University of Maryland and Executive Officer, Maryland State Board of Agriculture.



This Photograph Was NOT Taken at the Vermont Horse Traders Convention.

Sheep Diseases*

I HAPPEN to have lived for nearly thirty years in a district where we feed a million to a million and a quarter of lambs every winter, and for that reason I have been forced to learn something of the maladies associated with feeding lambs, because these feeders frequently come to the college and ask for assistance, and whatever we have learned about the diseases of sheep have come in that way.

As to any literature on sheep diseases, the only book in English at the present time that has any value, it seems to me at all, is Baker's Sheep Diseases, with which you are familiar. It needs revision, but I do not know when it will get it. The demands for veterinary books, as you know, are not very great at the present time and publishers are not easily influenced to put out new books or to revise old ones. There is no book on sheep diseases in a foreign language, so far as I know, that is of any greater value than Baker's in our own. There is a book in French and in German, but neither one is fitted to our conditions or as up to date as Baker's, so we are limited then in our literature on sheep diseases to Baker's work and various bulletins of the United States Department of Agriculture and of various experiment stations. The bulletin entitled "Diseases of Sheep," by the United States Department of Agriculture, is a very excellent work. If you are interested in parasitic diseases, then that entitled "Parasites and Parasitic Diseases of Sheep" is particularly valuable.

Our own bulletin is limited to the diseases of Colorado feeding lambs, and of course it is not complete at all, is not intended to be, but it contains brief accounts of the more important diseases of feeding lambs that we had studied up to this time. We had a companion bulletin all prepared and ready for the press. We were holding it up because we didn't have a sufficient number of illustrations. Two years ago, while I was down at the short course of veterinarians at the University of Missouri, we had a fire out there which burned our manuscript and all illustrations that we did have, so I don't know when that bulletin will appear. Illustrations proper for a work of this kind are not easily obtained, and it does not seem wise to put out merely a manuscript because we would only be repeating much of what the United States Bureau of Animal Industry has already published in their bulletins. Copies of our bulletin may be obtained by writing to the Colorado Experiment Station at Fort Collins. We will be glad to supply them free of charge.

The more common maladies of feeding lambs; those are uppermost in our minds just at present, and are largely of two classes —those having to do with errors or irregularities in the feeding process itself, in the diet or rationing, and those having to do with shipping.

I shall go into some detail into methods of feeding because it seems to me without a fairly clear understanding of methods, we are unable to give the best of service to these sheep feeders. The typical Colorado feeding lot is equipped with self feeders for hay and separate feeding pens for grain. The lambs are kept continuously in the pens between these self feeders. The racks are filled with hay and every day a man goes along and pushes down the hay so they can get it easily, and then twice a day the lambs are run out into a separate pen; the grain is scattered in troughs and the lambs are allowed to consume the grain, which they do very greedily and rapidly. They are then run back into the pens containing the self feeders for hay and another lot is let into the grain. The troughs are turned over after each feeding in order that there shall be no remnants of dirt left. Water is kept in the corrals at all times.

Another method that is fairly common is to allow the sheep to eat the hay through panels. It is a little more wasteful, but a

* Notes from an address by I. Ernest Newsom, Veterinary Pathologist at the Colorado Agricultural College, at the 41st annual meeting of the Iowa Veterinary Medical Association, Des Moines, Jan. 22-24, 1929.

little less expensive, to build a plant of that kind. You can readily see then that when a man builds a feeding system of this kind, it is permanent. It is easy enough to tell him to move the lambs out to new ground, but he can't move the troughs, feed racks, etc., so it is futile to talk about new ground.

In order to get the best results in feeding grain, you must have trough room enough for the sheep and no more. It is surprising how little details such as this make such a great difference in losses of lambs. If the lambs go out there and find that only half of the room is occupied, they will gobble up what grain they have there and change over to another place and get that, and get two portions instead of one, and that may make a difference between a profit and loss in the feeding industry, so this means a great deal to the feeder. If you have more trough room than the lambs will fill up, then, of course, spread the grain in just as much room as the lambs will occupy and no more.

Our chief problem at this time of year is a feeding problem. Up until about three weeks ago we had practically no loss of this character. About three weeks ago the price began to go up. Up to that time no one was in a hurry. It was expected that the price would go up at a later time, but no one wanted to push his sheep because the market wasn't highly satisfactory. In many instances he had paid as much or more than he could get, consequently there was no hurry about the matter, and I think as a direct result of that there was little loss, yet within the last three or four weeks we have had a great deal of loss, and I attribute it very largely to the fact that the price went up and the grain ration was increased to hurry the lambs into condition for the market. The heavy loss is attributable to the increase in the price of lambs, because whenever you begin to push grain on lambs you begin to have trouble.

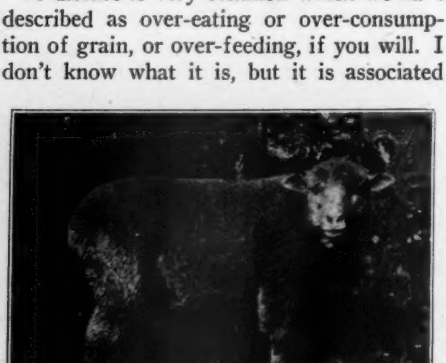
There are a number of reasons why we have pushed grains more in the last few years than formerly. In the first place the range man is raising larger lambs. Naturally he sells lambs by the pound, and the larger lambs he can raise, the more money he makes, so he is buying larger bucks and breeding them to the ewes and we are getting larger lambs than ever before. Fifteen or twenty years ago we thought lambs weighing 35, 40, or 50 pounds, average. Now we seldom get any that small. We more frequently get them averaging 75, 80, and 85 pounds. Then, on the other hand, in many years—not in every year, but in many years—large lambs are docked on the market. It not infrequently happens that a lamb weighing one hundred pounds or over will actually bring less money, or no more money, than a lamb weighing ninety pounds, so that the market frequently holds that the prime lamb is a lamb weighing ninety pounds or under. The dockage is so great on lambs running over that weight that you often get no more money for the heavier lamb than for the lamb in prime condition, so you see the tendency is to raise a larger lamb for feeding, and the tendency on the other side is to be forced to market that lamb before he has his full growth, consequently the feeder is between these two millstones as it were. He must take a larger lamb to feed, market him early, and finish him quickly, and he has been forced to feed more rapidly than previously.

In 1888, when we began to feed lambs, we got them in in October and November and sold them in April or May. There was no hurry; nobody cared how much they weighed; they didn't bring more than four or five cents a pound anyway. Nobody cared much about the loss because individual lambs didn't mean much, but lately the feeder has come against these two limits—a large lamb to begin with and the necessity of finishing them off, weighing ninety pounds or under. In addition to that, he has come to an increased price in hay. We feed, of course, mostly alfalfa. It has increased in price until now it is often relatively higher than corn. In addition to that, last year a lot of our alfalfa died out, winter killed, so we have a less supply than is customary, consequently the still greater tendency to feed more of the grain rations; and with an increase of grain rations is increasing trouble.

About eight or ten years ago we found we could raise corn of certain varieties out there. It was suggested that if we raise corn and if we could lamb that corn down, feed it out of the field, it would be much more economical than the old method for feeding sheep. So we raised a great deal of corn for a few years. We would get the lambs in early and run them in the field, but instead of letting them pick up the weeds and blades and shucks and then taking them out, as I understand you frequently do, we thought they could harvest the corn, clean up the field. It took us six or seven years to find out we couldn't. The lambs get along nicely in the cornfield for some time, maybe a month, until there was nothing much left except stalks, and then they start in on the corn itself. Losses begin and run up to eight or ten per cent, until finally the owner becomes discouraged and feeds them in pens or ships them to market in a half fattened condition. I do not believe it is feasible to lamb corn down; feed it up entirely by this method. We are still trying it at the experiment station. We have a section there that is doing feeding work, and we are still trying to devise some method of lambing corn down, cleaning up the fields, adding alfalfa hay along with it, or beets along with it, but as yet we haven't found any satisfactory method of using up a cornfield wholly with lambs without such heavy loss as to render it entirely unprofitable.

Losses From Overfeeding

A disease is very common which we have described as over-eating or over-consumption of grain, or over-feeding, if you will. I don't know what it is, but it is associated with an over-consumption of concentrate and it doesn't matter whether it is corn, barley, peas, or what the grain is, but when they get too much, then they develop cerebral symptoms. The head is thrown back, indicating a brain disturbance of some kind that is fairly typical of this condition that we associate with over-consumption of grain; not but what there are other diseases that will show the same, as there are.



A fairly common lesion associated with this disease is large blotchy hemorrhages under the peritoneum and over the intestine. I do not recall ever having seen such lesions in hemorrhagic septicemia. You will find these hemorrhages in the muscalature, in the diaphragm, and also in the abdominal muscle, very large hemorrhages. You don't always find these lesions, but it is frequently the case. In addition, you will find a straw colored gelatinous exudation in the pericardial cavity. The loss will stop if grain is withheld. If you are in doubt as to your diagnosis and think the trouble may be hemorrhagic septicemia, withhold the grain for three days. If it is this disease, due to overfeeding, the losses will stop. I have seen this occur many times.

Just this year a man was feeding ten thousand lambs in the Arkansas Valley. He was mixing grain and hay together, which is common in the feed yards around our stockyards. The usual method of doing that is to mix in a little grain at first, then keep increasing the amount until it gets up to about fifty per cent. He had gotten them up to that point where fifty per cent of the feed was grain; finally they began to die, and in two weeks he lost one hundred fifty lambs. He had his veterinarian out and they found these hemorrhages and ordered hemorrhagic septicemia vaccine. The veterinarian called us by phone and said he would like to have one of us come down, so Doctor Cross went down. He looked over the situation and came to the conclusion that it was not hemorrhagic septicemia, but was purely a feeding proposition. He made some recommendations and came back home. We learned that within two days the losses practically ceased. The man has gone ahead and fed

out his lambs with very little further trouble.

Here were those recommendations: First, cut down the amount of grain that you are feeding. Most feeders will not cut off the grain entirely. They don't like to do that. If you take a bunch of lambs, get them up on full feed and then cut off the grain, you lose a lot of gain, so they don't want to do that, and it isn't necessary. The thing that is necessary to do is to cut it down and in that case cut it down to one quarter or one third of the amount for a few days and then gradually build up. Usually that is sufficient. In some cases it may be necessary to cut it off entirely and put them on oats. I have never seen this condition on oats, so I think they are safe, but you can't fatten lambs on oats. The next thing is to sort the lambs. Some feeders haven't learned that lambs must be fed in proportion to their size. Here are little lambs and big lambs all running together. It isn't economy to feed in that way. The big lambs will get most of the grain. It is the big lambs that are dying. So sort the lambs and put the lambs of even size together. Another thing, by the time losses are heavy many of the lambs will be ready for market and it is among these that losses will be heaviest. Sort out as many of these lambs as are ready for market and ship them out. Then cut down the grain for the remainder. There are a lot of things to take into consideration on cutting down the amount of grain. Sort the lambs, ship lambs as rapidly as ready. In that way we have been able to work out the problem fairly well, but I think that the most important thing is prevention, of course.

Veterinarians are called after trouble is well along. Then they have to do the best they can, but it isn't necessary that these catastrophes actually develop. A variety of feed, in my opinion, is the best answer to this problem; the greater the variety, the better; the more succulent the feed, the better. We find the greater variety of feed we get, the less trouble we have. We recommended ensilage some years ago as being succulent and a good thing to add, but the corn in the ensilage must be taken into consideration in apportioning the grain ration. Ensilage isn't a preventive of this disease. These other feeds are preventive only insofar as they will hold down consumption of grain, but if they contain grain and increase the grain ration, then you will have trouble just the same. But a variety of feed, it seems to me, is the solution of this question.

There are other things that have to be taken into consideration. Start them in more gradually; build them up slowly. At the first evidence of scouring or vomiting grain, or of cerebral symptoms, or death loss, cut down a little. All those things will be of value.

A few words about what this condition actually is. About two years ago we began to examine the urine and we found the specific gravity ran from 1.045 to 1.056. That meant sugar, and we find that in most of these cases the sugar will run from 1% to 4%; not all of them, but a large percentage of these cases will show high sugar content in the urine. I don't know what that means. I wish I did. I wonder why we didn't find it years ago. Sugar in the urine is not common in our lower animals.

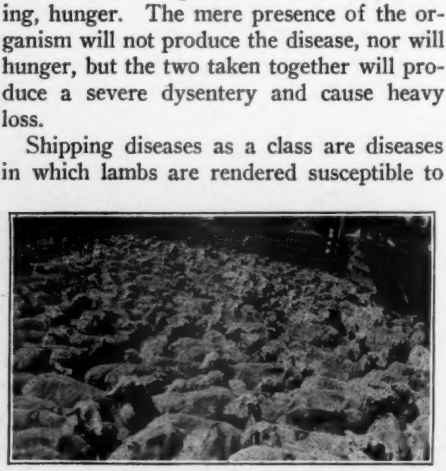
There is another factor that has come in, and that is the possible association of an anaerobe with this condition, a spore-bearing anaerobe. One has been isolated. In some instances filtrates have been made and have been inoculated into the sheep and good results have been reported. That seemed to indicate that we had the disease in this country that in Scotland is called braxy, and there are men who believe that this condition is braxy. We have been working for some years on that problem. We have been trying to find an anaerobe in these sheep. We have succeeded in about 25% of the cases in isolating the one from the spleens of these animals, but we have also succeeded in isolating this same anaerobe from the spleens of animals, particularly sheep, with all sorts of diseases, so while we haven't any records for publication, we have rather thoroughly come to the conclusion that sheep dying of any cause will show spore-bearing anaerobes in the internal organs, and that they probably have little or no significance. A man

in South America recently isolated this same anaerobe from a great many cattle cases.

Shipping Diseases

I have laid special stress on this feeding problem, but there are lots of other diseases from which the sheep man suffers losses. You may remember that in 1923 thousands of sheep were held up at Billings, Montana, for about nine days on account of floods and a lot of them develoepd a dysentery. When they did begin to ship out of Billings they came through Alliance, Nebraska, and back to Fort Collins, being on the road a considerable length of time. There were about thirty thousand sheep in these various shipments and we lost about two thousand from paratyphoid dysentery. We isolated the organism and with it reproduced the condition. We have a bulletin on that work. Two lots of these sheep are worthy of particular consideration. Both lots originated at Edgar, Montana. In one the loss ran to 16% and in the other to 2%. Both of them came down over the same railroad. The only difference is that those lambs in which the loss was 16% were fed only once on the way down and the others were fed several times. This illustrates the effects of hunger or fasting in this particular disease—paratyphoid dysentery. We conducted a number of experiments which showed conclusively that loss from this disease requires two factors—first the organism and secondly fasting, hunger. The mere presence of the organism will not produce the disease, nor will hunger, but the two taken together will produce a severe dysentery and cause heavy loss.

Shipping diseases as a class are diseases in which lambs are rendered susceptible to various organisms by going without food, by exposure, by fatigue, and by chilling. We class them all together as shipping diseases. Paratyphoid dysentery is of this kind. I do not know how frequent it is. We have never isolated the organism since that time, so apparently it isn't very common. We don't know where the organism comes from and we haven't had duplication of these conditions, so haven't had duplication of the disease.



Hemorrhagic septicemia is also a shipping disease. It is a disease of animals that are below par—animals that have been exposed to bad weather in transit or possibly kept under bad conditions on farms. It is not in our experience a disease of animals in good condition, well housed, well fed and kept under the best possible conditions. We do have hemorrhagic septicemia, some years we have a great deal. Other years we don't have any. Hemorrhagic septicemia in our experience comes in the first two or three weeks after the lambs have come to the feeder. It is not a disease that develops late in the feeding period, but it is not the only one that develops early. Hemorrhagic septicemia is a true septicemia, but it becomes later a disease of the respiratory tract. The heart hemorrhages that you associate with hemorrhagic septicemia may be associated with a great many diseases. Every outbreak of hemorrhagic septicemia will show after a few days a large percentage of pneumonia

Chronic Hemorrhagic Septicemia.

cases. The acute type, of course, shows only hemorrhages. At one time I inadvertently or unfortunately made the statement that pneumonia was hemorrhagic septicemia. The shipping conditions were bad at the time. We diagnosed hemorrhagic septicemia on the isolation of the organism. We had so much pneumonia that I came to the conclusion that most of our pneumonia was hemorrhagic septicemia. Certain years it is and certain years it is not.

Lip and Leg Disease

Lip and leg ulceration is a disease that affects nearly every lot of feeder lambs that come in. Ordinarily it isn't serious. The lips get rigid from the crusts. They have difficulty in eating, but it passes off within two weeks. We don't need to pay much attention to it. In more recent years we have found complications. One of those is pneumonia. Sometimes they develop this lip condition the first week or two after they come into the feed lots and then in a couple of weeks they die of pneumonia. There is a lot of dirty fluid in such cases in the pleural cavity. Areas in the lungs are necrotic. From those cases you can not isolate the bipolar organism. We are having an increasing amount of this type of pneumonia.

We had at Sterling, Colorado, a few years ago a lot of one thousand lambs. They were shipped from somewhere in Montana to Omaha and then back. The owner told us they got lost. Well, they were gone for a week or ten days. When they came they developed sore mouths and then they began to develop pneumonia. There were no bipolar organisms in these lungs. They even developed laryngeal diphtheria. The necrotic areas were on the tongue just as in calf diphtheria. This was the most unusual outbreak of this condition I have ever seen, and we attributed it very largely to the conditions of exposure in this long shipment. It at least made the disease worse. So that's another cause for pneumonia.

Urinary Calculi

Urinary calculus is a condition that is comparatively rare with us. I presume you have some trouble with that in this country because a lot of work was done with it some years ago at Ames. They found urinary calculi could be produced by a long feeding of sugar beets. That is, their first year's experiments were negative, but later they did produce urinary calculi be feeding sugar beets over long periods of time. Some of our lambs are on sugar beets and some are not, so I cannot confirm the view established at Ames that sugar beets are necessarily important with the development of this disease. It produces rupture of the bladder and sometimes heavy losses. This is a thing that is easily overlooked. You go out to where lambs are dying and you find accumulation of fluid in the peritoneal cavity. Until you look particularly for it, you are apt to overlook the fact that the bladder has been ruptured. Of course female lambs do not have this trouble. An operation is done by some of our men and it saves some lives, but it isn't highly satisfactory. If the lambs are in condition for market it is better to ship the well ones and take whatever loss there is, although in a lot of lambs the percentage that die does not run high; twenty-five or thirty lambs out of a thousand is as heavy a loss as I have ever known. The stones in the bladder are not hard, but soft—as long as they are moist they are soft.

Rheumatism

I have seen but one lot of lambs showing any considerable amount of rheumatism, and in that lot more than one hundred showed symptoms. I looked into the history, but couldn't find anything significant; they had been shipped and kept under good conditions, yet some developed arthritis. There was a little coagulated mass in certain of the

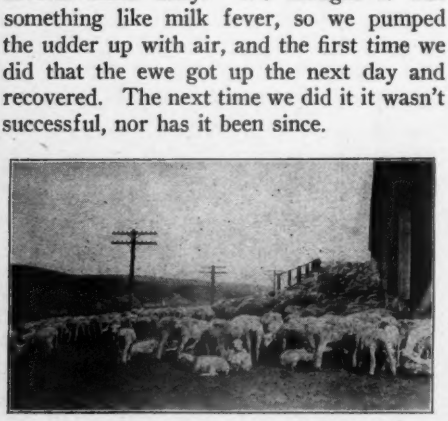
joints of the limbs. Pus could be demonstrated in the joints. We tried a good many cultures; we could never find the organism that was causing it.

Tetanus

We get a few cases of tetanus as a result of ear tagging. It isn't common. They act a good deal like any other animals do, quite stiff legged. This disease is seen, of course, in some states as the result of castration and of docking and sometimes from shearing wounds.

Preparturient Paralysis

Preparturient paralysis is a disease that develops a little while prior to lambing, in ewes that are specially well fed and have little exercise. It is commonest in ewes bearing twin lambs. They go down, stagger a little and lie sometimes for weeks, sometimes die within a few days, but it is usually fatal unless treatment is given. It is common wherever sheep are raised. The work at the Kentucky station shows it is associated with acidosis. We find it is most easily prevented by ample exercise, cutting down on the heavy ration, allowing a succulent diet and keeping the bowels loose with doses of salts. Sometimes if these ewes, just after they have gone down, can be gotten up and forced to take exercise, and given a dose of salts, they can be saved, but mostly they die. The condition is rather easily prevented. You may have to force exercise; you may have to drive these ewes several miles daily. We thought it was something like milk fever, so we pumped the udder up with air, and the first time we did that the ewe got up the next day and recovered. The next time we did it it wasn't successful, nor has it been since.



Pneumonia

Progressive pneumonia is a disease that you probably do not deal with. We get a good deal of it in Colorado, a disease of breeding sheep, a slow-going pneumonic condition. The animals live for months, yet keep getting thinner and thinner and finally die. I know of no treatment nor any method of prevention.

Ictero-Hematuria

Ictero-hematuria is the disease that occurs in the mountains—that is, in mountain sheep. It is easily recognized. The tissues are extremely yellow throughout. Even before the animal dies, if you look at the skin you will see it is yellow—jaundiced. The whites of the eyes are yellow; all the body tissues are stained yellow; the urine is either red or coffee colored, and of course in this country you would see it only in older sheep, never in lambs—and those coming from mountainous areas. Of course the disease, as you know, was described in Roumania and was attributed to a tick. We have not found the tick. We still think it is an insect borne disease. It is all too frequent with us, causing us a great deal of concern, but we do not know its means of transmission or its cause.

Tapeworms

Tapeworms are commonly found in bile ducts; in some western lambs you will find large numbers of them. We don't find them so frequently as we used to. Doctor Hall tried for years to find the intermediate host of this tapeworm, but was unsuccessful. I doubt if this causes any very serious losses in lambs. However, there is a tapeworm that is causing us concern and that is the big tapeworm, a tapeworm several feet long. It will cause death in lambs. Kamala is the best treatment. Give it in sixty grain doses. We follow it with two ounces of salts. The salts may not be necessary. The treatment is very effective. You give the kamala, mix it up with water, and within twenty-four to forty-eight hours you see great masses of tapeworm lying around the corral. Where you have that big tapeworm to deal with use kamala.

What Classes of Pharmaceutical Preparations Should Be Used by the Veterinarian

By G. W. BROWNING, Mobile, Alabama

IN TREATING the dumb animals, we are offered drugs from the drug stores and commercial houses that sell to veterinarians and physicians only, and the patent medicine vendor, in several different forms, namely:

Compound Powders

These are purely physical mixtures, no chemical reactions occurring during their manipulations. However, this does not apply to synthetic drugs, but in this discourse my references will be mostly to botanical drugs. These compound powders are largely survivals of past pharmaceuticals once popular in medicine and pharmacy, and were very serviceable to the profession during the early part of the last century. Notwithstanding the objections of many persons who comprehend the evils of polypharmacy and who often illogically went into the contrary not less extreme, many of the compound powders withstood all theoretical attacks, being increasingly used today, their action not being paralleled by any single substance. Chief among these may be cited Dovers powder, antibilious physic and the standard compound powder of lobelia introduced as emetic powder nearly one hundred years ago. In veterinary practice the compound powders are too bulky for the small animal practitioner and are mostly confined to making condition worm powders for horses and cattle.

Concentrations

These include alkaloids, resinoids and glucosides and these preparations are looked upon as a class "as hold overs" from the pharmacy of the past. They then formed a useful link between the vegetable crudities of primitive pharmacy and the better understood pharmaceutical preparations of the present. Many of them carry extractives that cannot be defined in scientific terms, which does not, however, mitigate their usefulness, as physicians and veterinarians who prescribe them fully comprehend. Others are definite compounds as for example, the sanguinasin and hydrastin alkaloidal salts. One objection to their use is that being in powdered form renders their administration inconvenient, while if put into pill or tablet form, they are at a disadvantage as contrasted with liquid representatives of the same drug.

Elixirs

These flavored and medicated syrups, popular about 1860 were at that time excusable because of the primitive pharmacy that then prevailed, which included many nasty illogical plant conglomerates. The elixir craze caused the expenditure of an astonishing amount of money for both sugar and large size bottles required to carry a modicum of medicine. The money was possibly well spent in that it helped to decrease doses and to bridge the way to both a better pharmacy and improved remedial agents. But even in those days of cheap alcohol with other ingredients at moderate prices came gradually a recognition of the fact that bulk amounts (a large bottle for little money) was both unnecessary and expensive. Sugar could be purchased cheaper at the grocery. As opportunity presented the different pharmacists have gradually discarded item after item of the elixirs, until a very few are kept in stock. Conse-

quently the making of elixirs for the medical profession will soon be of historical interest only. A few drops of a concentrated medicine in four ounces of water will give the drug value of much "elixir."

Fluid Extracts

Fluid extracts may be regarded as a class of primitive pharmaceutical preparations, their numbers being practically unlimited. In the passing along, they served a useful purpose in the evolution of plant pharmacy. That they were not altogether satisfactory to thoughtful physicians even at an early date, is exemplified by the fact that Prof. John M. Scudder, in discouragement, nearly half a century ago titled them "the great American nastiness." It is not necessary, however, to discuss here this phase of the problem "nastiness" either past or present. Be it sufficient to remark that for varied and presumably valid reasons, fluid extracts have gradually lost favor with physicians and I venture to say, cheap fluid extracts are the real basis for a lot of therapeutic nihilism.

Solid Extracts

Solid extracts may be likened to plastic residues obtained when fluid extracts are evaporated to a mass consistence. With a few exceptions, such as constituents of pills, these once popular preparations are not now extensively prescribed by physicians. This is because of their displacement, due to advanced pharmaceutical processes and the market supply of sugar and gelatin-coated pills, ready made for use. As made in former days, solid extracts were but defective representatives of the drug used in their manufacture and will disappoint the prescribing practitioner.

Powdered Extracts

As convenient plant products for making powder mixtures and prescriptions, this class of preparations came into the field about thirty-five years ago. Their names were then legion, the commercial lists comprising about all of the drugs presented in fluid extract form. Being suitable for prescription use in the making of extemporaneous mixtures of powders, they still occupy a field that cannot be filled by solid extracts, which are of a pasty consistence. The therapeutic constituents of many drugs, however, cannot be put into powdered form. According to the process used in those days the heat necessary in the drying process dissipating many of the volatile plant constituents, and destroying others, very unstable but not less essential. For this reason, such items as iris and canabis indica and drugs containing evanescent constituents were virtually ruined by being reduced to a powdered extract. There is always a question concerning any plant preparation that is dried and prescribing veterinarians should be aware of this fact, and purchase his powdered extracts from laboratories that don't use excessive heat in reducing the crude drug to a powder.

Syrups

My remarks on elixirs apply in many cases to the sweetened aqueous liquids known as syrups. In these, in a few instances, as with iron salts, such as the iodid and the ferrous carbonate, sugar becomes an important preservative. In others it aids in solvent directions, with such vegetable drugs as contain so-called tannates. These as a rule are quite soluble in syrup, but less so in water. If it be in proper (considerable) proportions, sugar prevents alcoholic fermentation and furthers other destructive reactions, prone to occur in vegetable products. If sugar be too abundant, chrystalization results on decrease of temperature, especially if alcohol be present.

The study of syrups as a whole is not characterized by pharmaceutical simplicity imagined by some persons. On the contrary, extensive experimental research by qualified experts has for decades been fruitless in the way of overcoming defects in several complex syrups, of both organic and morganic materials. This

applies both as concerns representation of the drug and the keeping qualities of the syrup, and for the above reasons, where one uses a prescription in the liquid form, one will do well to use water for a vehicle instead of syrup simple or compound.

Pills, Capsules and Tablets

For the small animal practitioner, unless he wants immediate action, medicine in a pill, capsule or tablet is probably the most handy and economical way of administering medicine to his patients and if the drugs are pure that go into them they should be as effective as any other form of medication, capsules may be filled with a powder, liquid or both, providing they are not incompatible. Pills are uncoated, gelatin coated or sugar coated and tablets are usually uncoated or sugar coated and capsules are hard or soft to suit the manufacturer's needs.

It is unnecessary to dwell on the kind of capsule to use as those used by commercial laboratories are practically all alike as far as the capsule is concerned, and for treating the dog and fox are very convenient way of administering medicine to these animals. However, there are some objections to a capsule that a sugar coated tablet does not have, especially when treating the fox or any animal that is vicious or which it is not practical to catch often. The capsule rarely conceals the odor, and the animal will usually refuse to eat it when stuck into a piece of meat; while a tablet that is properly sugar coated will be readily eaten by most animals unless it contains a great amount of essential oils.

Tablets As They Should Be Made

In the making of a reliable and effective tablet the medicaments to avoid deterioration should be moulded in the dry powdered state with very little compression, and without excipient or agglutinating material. Tablets made thus permit rapid permeation and solution of the medicinal ingredients and upon ingestion, rapidly disintegrate in the stomach juices thereby producing a true physiological solution of the medicaments. Further, the absence of moisture in the tablet protects them from chemical or climatic changes, except under the most extroadinary conditions. However, any tablet to look nice should be kept in either cork or screw cap bottles, and dispensed in bottles. Pasteboard boxes have ruined many an otherwise good pill or tablet.

Other Liquid Preparations

Besides the elixirs, syrups and fluid extracts, I wish to mention a few other medicine that are put up in the liquid form, and while they are not used extensively by the veterinary profession, I consider them very useful and even superior to some fluid extracts, these are the normals and specific medicine. In my practice, I use more of them than I do of the fluid extracts or any other liquid medicine, as most of them are made out of the green plant, look nice and are free from the nasty precipitate that occurs in most fluid extracts.

The Patent Medicine Vendor

The only reason I mentioned this is I know of quite a few laboratories with no qualified physician or veterinarian at the head, offering their products to the graduate veterinarian, but to what extent the veterinarians buy from these firms I am not prepared to say. However, I do know of some that do.

I have been of the opinion for a long time there are entirely too many worthless compound formulas being offered the practicing veterinarian for his own good or the good of his clients. Buy your drugs single and do your own mixing. It can be done without taking up very much time and requires but very little extra expense. By so doing, you will know your formulas better and have the satisfaction of knowing your drugs were pure that went into the mixture.

The nostrum makers have always been with us and probably always will be. I was amused in reading Dr. J. H. Weiner's two articles in the February and March

issues of VETERINARY MEDICINE on tricks of the nostrum makers, while I consider this a timely article, don't quite agree with him in all he says. For instance, in where he says 2½ grains of santonin should be the minimum dose, if of a good quality as he says this should be, this is the maximum dose for the dog, I was taught and my experience in giving santonin bears me out in it that the dose is from ¼ to 2 grains, and his 99% of pure water would not be so far out of the way in some prescriptions, as here is one I have used with marked success for many years for vomiting in dogs.

℞ Specific Med. Nux Vomica MX
Aqua pura qs. ad. ℥IV

Mix. Sig: teaspoonful every hour or two.

When simple syrup is used in place of the water, it makes matters worse.

I don't believe it is necessary for a veterinarian to be an expert chemist in order to be a successful practitioner or to be good in therapeutics, but he should know enough about chemistry to keep him out of the pitfalls of combining incompatibles, and to know what drugs act synergistically. What we need is more practical men in the veterinary profession today, less impracticable theory, more men that think for themselves and more men that look after their own prescriptions. There is, I believe, too much proxy practiced in our prescription business. We should do our own thinking on these matters, as a man that doesn't think is not an educated man regardless of how many college degrees he may have obtained.

Here is how I have conducted my practice for the past several years. However, I am now speaking for myself. I purchase my crude drugs singly, and mix them at leisure times into the different prescriptions I have regular calls for, for instance such as tonic powders, or worm powders for the horse, and hog, etc. I mix soon after receiving the powder, put in tin cans which can be purchased from the American Can Company or a great many other can companies, and put my own label on it and set these cans away until called for. This manner of putting the powder in cans enables one to keep it almost indefinitely. When put in paper bags or pasteboard cartons, it is bound to absorb more or less moisture especially in this salt water atmosphere. My liquids are dispensed only as called for. My powdered drugs for small animals are put in capsules by myself and put in screw cap bottles until dispensed. My sugar coated tablets I hire an ethical laboratory to manufacture. In this way of prescribing I have full control of the ingredients and know my prescriptions and gives me a chance if I should discover any defect in the formula to remedy it to the mutual benefit of my clients and myself, which I could not do if I were buying my prescriptions from a commercial house so I don't approve of putting a lot of synthetic drugs into one capsule or tablet. While this might look all right to a chemist, it is enough to make a man well up in therapeutics blush.

FRIGHT DISEASE NOT NERVOUS TYPE OF DISTEMPER

I have been a reader of VETERINARY MEDICINE for sixteen years and I don't remember ever to have seen such a fine description of a condition as the one entitled "Hyperkinesia—Running Fits" by William Lintz, M. D., in the August issue of VETERINARY MEDICINE.

Doctor Lintz certainly goes into detail and has proved conclusively (to my mind) that running fits is a condition and not a specific disease. His very detailed description of symptoms, pathological findings and bacterial examinations convinces me that the diseases he describes is distemper of the nervous type. The reason he could not find the causative organism is because it cannot be seen, being a filtrable virus. His blood injections bears this out. As for a description of the nervous type of distemper, I don't believe Doctor Lintz' description of hyperkinesia can be beaten.

But as a description of running fits—well, it doesn't fit for my cases.

I handle a great many dogs of all breeds with both so-called running fits and the nervous form of distemper, and there is very little similarity. I am sure that if Doctor Lintz will treat this as a distemper infection, he will arrive at better results than if he continues on the basis that it is so-called running fits. Personally, I have never found anything that was of any benefit in the nervous form of distemper and apparently Doctor Lintz has found it to be the same.

As for true running fits, I can assure Doctor Lintz that if he will change the diet to some orange juice and milk in the morning, and raw fresh beef (ground) with beef broth at night there will be little need of doing more, although often I use in addition, a tablet composed of calcium carbonate 3½ gr., magnesium carbonate 2 gr., Bismuth subnitrate ½ gr., peppermint and aromatics. Of these I give one tablet three times a day. Don't misunderstand me, and think that the above is the treatment or food for the diseases Doctor Lintz has described; it isn't. It's a treatment for genuine running fits.

To me, so-called running fits is due to one thing only, and that is indigestion with gas formation. This indigestion may be caused by several things, such as improper feeding, lack of raw meat, too much dog biscuit, worms, bacterial fermentation in the intestines, etc.

Amherst, Mass. Frederick G. Ruder.

Comment: Doctor Lintz, when shown the foregoing comment on his article and similar comments from others, stated:

"I appreciate the interest taken by the veterinary profession in our humble efforts.

"I still insist however, that the disease described in the article was not distemper nor any form of distemper. I am well acquainted with all forms of distemper due to the fact that Mrs. Lintz manages and owns the largest St. Bernard kennels in the world.

"How can your correspondents completely ignore the fact that mature dogs that have had distemper and won championships at the ring, were afflicted with this malady and died from it? On autopsy not the slightest sign of distemper was to be found. Also, the prompt reproduction of this disease in the black mongrel, a street dog that had undoubtedly had distemper, and the prompt reproduction of this disease in police dogs and other mongrels, who showed upon autopsy, not the slightest sign of distemper, not even the puppies that died from it? As I said before, how can one completely ignore these facts?

Brooklyn, N. Y. William Lintz."

PLANTS SUSPECTED OF BEING POISONOUS

I am always glad to identify a supposed poisonous plant for the readers of VETERINARY MEDICINE. I will always give the identification of these plants careful consideration.

Here is a letter from Dr. H. L. Messmore of Oneida, Illinois. Some thirteen different plants were sent to me and the following letter:

I saw these animals (a few short horn cows) for the first time yesterday evening (7:00 P. M.). At that time there was only one cow showing anything abnormal—temperature 103 F., respiration slightly accelerated, standing, but very wabbly,—in fact on being made to move her hind legs, spread laterally from the body as far as possible. She had taken but a few steps when she went down in a heap, falling forward on her neck and shoulder. This did not seem to cause any more rapid breathing, nor to excite her any, but after going down I noticed the pupils were greatly dilated and I suspected that vision was affected when she was trying to walk away from me. Closer examination substantiated that. She immediately got on her feet and with the legs spread laterally, was able to stand fairly

quiet. The bowel movement was scant but of normal grass looseness. The owner stated that he noticed the day before that she acted "dumpish" and did not follow the other cattle as usual. The treatment consisted of saline purgatives with gentian and sodium hyposulphite.

This forenoon the cow was unable to get on her feet but could make the attempt when urged, lying on her chest in a quiet state and ruminating occasionally.

Close examination of seven more cows and the herd bull revealed four cows affected slightly, that is, dumpish to the extent of being noticeable if watched for a few minutes, one of them on the verge of becoming unsteady on her feet. On being made to walk, she would occasionally show a partial loss of control of her legs. Normal urination and bowel movement as far as could be noticed.

I immediately looked over the pasture, which consists of about 20 acres of white clover, and has been fed off fairly short—these cows having been on it most of the spring and summer. It is high land pasture, with exception of one corner, where a little seepage water keeps it moist enough for variety of weeds to thrive. The fence is wire on three sides and a high hedge on the fourth side—the west side—and there is a variety of weeds growing along this hedge. I couldn't find any in flower; the pasture proper is practically free from weeds.

I am sending under separate cover a few specimens I obtained along the hedge. The one with the large root was pulled out of the west corner of the pasture. This type predominates there.

Among the plants sent were the Evening Primrose, *Oenothera biennis,* a well known plant of the family with yellow flowers, a stout stalk and first year leaves close to the surface of the ground. My observations extending over a period of years indicate that animals will not eat this plant. It is possibly poisonous.

There was sent also a White Avens, *Geum macrophyllum,* a white weed, five finger, meadow artichoke and maple leafed goosefoot. Also there was included a specimen of pellitory, which may be slightly toxic. However, none of the plants sent are responsible for the symptoms described by Doctor Messmore.

I am inclined to think that he will find in the pasture, in the low wet ground, cowbane, *Cicuta maculata,* which is quite toxic.

LOSSES FROM HOG CHOLERA ARE AT NEW LOW LEVEL

Hog cholera seems to be slightly less prevalent this year than last, and last year the losses from the disease were the lowest since the United States Department of Agriculture has been keeping records, Dr. U. G. Houck, associate chief of the Bureau of Animal Industry announced October 18 in a summary of information assembled from 31 States.

In four of these States, however—Indiana, Michigan, Nebraska and Ohio—hog cholera is more prevalent than last year. Approximately the same amount of cholera as last year was reported for Colorado, Kentucky, North Carolina, Texas, Illinois, Mississippi, Tennessee, and Wisconsin.

In Alabama, California, Georgia, Kansas, Maryland, Oklahoma, South Dakota, Virginia, Washington, West Virginia, Arkansas, Iowa, Florida, Idaho, Louisiana, Missouri, South Carolina, Utah and Oregon observers report less cholera this year than last. With the exception of three States the decreases are slight, but Oklahoma reports a reduction of 50%, Louisiana 40%, and Idaho 30%.

The hog cholera situation, in general, is somewhat better than last year.

BORNA DISEASE

In infectious cerebro-spinal meningitis in the horse, is the percentage of cures greater with the use of botulinus antitoxin than without this biologic?—P. J. D., Florida.

Reply: No. The disease has no connection with botulism, which is rare in horses.

FATIGUE—HEALTHY AND UNHEALTHY

The symptoms of fatigue may be either physical or mental or both. For example, it has been found from experiments performed on animals that the nerve leading to certain muscles will be exhausted although the muscle will be able to work perfectly. When this happens there is a lack of coordination, a very serious situation in certain forms of industry. The working man whose brain and muscles do not work in harmony is in danger of sustaining a severe accident. This is especially true in running machinery which demands mental as well as muscular action.

Heavy physical work can be done more efficiently by comparatively younger men. Chronic fatigue is bound to attack the older men in such groups as coal miners, iron, steel, and tinplate workers sooner or later and this creates an industrial problem that may well be faced. Naturally the older the man becomes the more wages he should be worth and is entitled to, yet the fatigued man from 40 to 50 will undoubtedly be scrapped at the age period when he should be feeling more settled in life. In time it may be possible for these men to learn an alternate trade and then the problem of chronic fatigue can be abolished in these trades.

In thinking about fatigue it is interesting to note that experiments performed on dogs have shown that diet greatly influences their susceptibility to fatigue. Dogs at Cornell Clinic in New York City were made to run on revolving platforms. When they had run for one mile, they were allowed to rest for one hour. This was repeated until they had run four miles. When they had been fed on carbohydrates and fats they could run on their reserve strength over a period of 28 days with no food, only water. They were exercising at the expense of their body fat and the fatter ones could run much better than the excessively thin ones.

Athletes training for races have also been fed on different diets to find out which kinds of foods gave them the longest endurance. The carbohydrates were used up first while the fats were more slowly absorbed. Long standing fatigue cannot be helped except temporarily by food, but a physically tired person often can be pepped up for the time being by taking sugar.

The present fad for dieting then would certainly seem to be a foolhardy one to pursue for the person who does a great deal of muscular work or play. It is foolhardy anyway without the doctor's orders.

While fatigue is seldom a direct cause of death its presence brings about a rundown condition that may lead to frequent colds, grippe, and sometimes to more serious illness. Fatigue is also a common symptom of tuberculosis and is regarded by the physician as one of the early danger signals of that disease. This fatigue, however, is not the same as that which is the result of overwork.

To combat fatigue doctors urge the use of soundproof devices, modern improvements in factories and work shops, and mechanical fatigue abolishers, but above all they urge the intelligent pursuit of health habits, the most important of which is sufficient rest. Take time out once in a while to relax the whole body, open the windows, take a walk in the sunshine during your noon hour, eat nourishing and well balanced meals, stop worrying, keep yourself physically fit by consulting your doctor regularly once a year before sickness can attack you instead of after it has.

This is the sort of advice given by the National Tuberculosis Association and its affiliated associations in their educational campaign to prevent such sickness forerunners as fatigue. Their work is supported by the penny Christmas seals sold in December.

New York City. Elizabeth Cole,
National Tuberculosis Association

BUTTERCUP OR CROW-FOOT POISONING

E. A. Brockmeier, Manchester, Iowa, writes as follows: "Under separate cover, I am sending you several plants which we think poisoned some hogs. These hogs broke into the right of way of a railroad and ate these plants and developed the following symptoms: Blindness and apparently deafness with a running into objects and turning and walking until they again run into objects. They always had their heads down. Their temperatures ran about 102° to 103° F. The bodies felt cold, respiration was deep and slightly fast. If you can give us any information on this plant, we will appreciate it."

The specimen sent for identification is *Ranunculus belborus,* the most common crow-foot, or buttercup, in the state of Iowa. It is a low, hairy, or nearly smooth, glabrous perennial; ascending, or often producing long runners; leaves with 3-stalked divisions, the terminal one broadly wedge-shaped, 3-cleft or parted; flowers yellow, petals obovate and larger than the sepals; stamens numerous; pistils numerous; style long and attenuate; fruit an achene. Distribution, common in moist shady places in the northern states.

This buttercup is extremely common in low pastures. At this time of the year, the yellow flowers are quite striking. This is a member of the crow-foot family, and many of the plants of this family have very acrid properties. The leaves of the plant have an acrid, peppery taste and cause blistering.

According to Basiner, the oil of Ranunculus acts, in warm-blooded animals, as an acrid narcotic, producing, in small doses, stupor and slow respiration; in larger doses, also, paralysis of the posterior and anterior extremities, and, before death, convulsions of the whole body. The acrid action is shown by a corrosive gastritis and by hyperemia of the kidneys, more particularly of their cortical substance. Anemonin causes similar symptoms, but is followed by no convulsions, nor does it irritate sufficiently to corrode the organs, as the oil does.

Dr. Millspaugh mentions especially the *R. bulbosus* as having a peculiarly powerful irritant action upon the skin, whether applied locally or internally. Murray states that a slice of the fresh root (bulb) placed in contact with the palmar surface of a finger brought on pain in two minutes; when taken off, the skin was found without signs of extra circulation or irritation, and the itching and heat passed away; in two hours it nevertheless returned again, and in ten hours a serious blister had formed, followed by a bad ulcer, which proved very difficult to heal.

Stebler and Schroter state that *Ranunculus acris* produces diarrhea, abortion, and loss of flesh, and when eaten in large quantities, death ensues in a few hours. Dr. Johnson, in his Manual of Medical Botany of North America, says:

"The ranunculi are too acrid to render their internal use either desirable or safe. Most of them are avoided by domestic animals; one may often see *R. acris,* for example, growing luxuriantly in pastures where almost every blade of grass is cropped close. Their acrid properties have, however, led to their employment externally as rubefacients or vesicants in cases where other and perhaps better agents were not at hand, or were for any reason contra-indicated. As is well known, cases of idiosyncrasy occur in which cantharides are inadmissible on account of their effect upon the urinary organs. In some such cases ranunculus has been used with good effect. One of the faults of this agent is its extreme violence. An interesting observation regarding the possible effect of *R. acris* on pregnant cows was reported to the author by the brother, Mr. F. M. Johnson. In a herd of cows pastured for years in succession in an old field thickly beset with this weed, abortion was frequent and troublesome. As soon, however, as this pasture was broken up and the herd moved to another part of the farm in which the plant did not grow, abortion disappeared. Now, although as stated above, domestic animals avoid this plant, yet when feeding where it is very abundant, they must occasionally swallow it accidentally; and, though there is no positive proof that the abortions were due to the plant in question,

the facts as stated are interesting and significant. It is at least possible that ranunculus exerts an influence upon the reproductive organs like that which is claimed by some for pulsatilla."

Ames, Iowa. L. H. Pammel.

PREPARTURIENT PARESIS OF EWES IN NEW ZEALAND

I would like to ask you about one or two diseases in sheep which we have out here. First, sleepy sickness in ewes, just a few weeks before they are due to lamb. They just get sleepy and die. It is mostly aged ewed carrying twins, and on the flat country, they seem to be more affected. The only remedy as far as we know, is plenty of exercise. I think you had an article on this trouble in your journal a few years ago.

Second, trouble with lambs dying just when they commence to eat grass. It is always the biggest and best lambs that die, and always singles. It is hard for a man in general practice to come to a definite opinion, but my experience is that when ewes are carrying lambs, they should not be fed on turnips, and that where the land has been limed and sheep fed on lucerne hay and green feed, there are not any losses with the lambs.

It is what is called pulpy kidney, but in my opinion, it is a deficiency of minerals. I would be very pleased if you could give me a formula for a mineral lick and a method of using same. There are a few mixtures on the market here containing ferrous sulph., potassium salts, sulphur, etc., mixed with salt to be put in special feeders for licks for the ewes before lambing. J. P. Mc., N. Z.

Reply: Sleepy sickness in ewes we term preparturient paralysis, the exact cause of which has not yet been worked out. It seems to be a toxemia, and the symptoms are as you have mentioned, mostly in ewes carrying twins or triplets. Whether there is any connection between this and milk fever in cows may be worked out later. But as the practitioner is more interested in treatment and prevention than in theorizing, allow me to give my method. About six weeks before lambing we mix up the following mixture, which of course, is made larger or smaller according to the sheep to be treated:

Steamed bone meal	10 lbs.
Granulated sugar	10 lbs.
Slaked lime	5 lbs.
Charcoal	1 lb.
Saccharine	4 oz.
Pot. iodid	4 oz.

We divide this into 20 cans, and tell the client to mix a can in enough whole oats and bran to feed 100 sheep every other day. In other words, each ewe gets around twenty grains of potassium iodid during the period of pregnancy, and we like to shut off all mineral mixtures at least two weeks before lambing. We also feed chopped alfalfa on which is poured a molasses mixture. A large sprinkling can is filled half full of hot water, and molasses is then poured in, shaken up, and the mixture sprinkled over the hay three times a week. I had one client with 14,000 head follow this procedure and he reduced his losses one-tenth. We can also add sodium bicarbonate to the mixture, or we can take a pound of potassium iodid and ten pounds sodium bicarbonate and mix with a ton of salt as a lick, although ewes will not eat enough salt medicinally treated. If one can treat the ewe when first sick with aromatic cascara, recovery may occur in about 50% of the cases. Exercise, molasses, whole oats, bran, plenty water, and non-constipating food the last month before lambing has been more successful with the ewes under my observation than any other line of treatment.

Using hemorrhagic septicemia aggressin has helped some in lambs dying under conditions similar to those you describe. Just what causes this is not known, but it may be akin to blackleg in calves. In fact, what we don't know about sheep diseases will fill a much larger book than what we do know.—E. T. Baker.

The Selection of Feeds

By D. D. GILES, Nacogdoches, Texas

TO WHAT extent are we interested in the selection of gross feeds? One often hears a certain food substance acclaimed as the best one that exists. It is my contention that there is no best feed or no best combination of feeds. I venture further to say that there is no one *balanced* feed.

The well-informed feeder has long ago learned that it is not grain or hay as such that should attract his praise. He has learned that the gross grain or hay is not worth a single thing to his livestock. It is the specific nutrients and life promoting elements that are contained in that grain and hay that will prove of benefit to his animals and will consequently reap a personal reward for him. Until a feeder learns to look below the surface he will be hoping to get results instead of actually getting them. Which offers the surest route to success, the path of luck or the path of knowledge and understanding? In our newer knowledge of nutrition we are still just beginning to understand the fundamental demands of the animal, but surely we can clear our conscience enough to apply rightly those few facts that we do know.

Before one can select a feed with any degree of correctness he must clearly have in mind just what is expected to come from that feed. Will the feed be fed simply to maintain animals? Will it be fed for production of energy that will in turn be transferred into work, or milk production? Or will it be fed to fatten animals? Each of these requires a different type and combination of nutrients. If the feed or combination of feeds are to be fed for maintenance they must supply energy, vitamines, minerals and protein.

The energy must be given the animal to furnish fuel for body activities such as respiration, circulation, secretion, excretion, and absorption and assimilation. In addition enough energy must be supplied to care for the loss from voluntary movements as walking, mastication, defecation, etc. It is essential that the energy be supplied in feeds that the energy can be extracted from with a minimum of activity by the animal. If there are only 1,000 calories of usable energy in a feed, and the animal expends that much energy in extracting it, he does not benefit any from the feed he has consumed. The feeder must calculate the feed value from a net basis rather than from the gross.

If good pasture is not available vitamines become a limiting factor, and one should realize that the feeds purchased must supply vitamines A-C-E-F & G. Vitamin D is also a limiting factor, but this is supplied in ample amounts by exposure to direct sun rays. When this is so available, it would be folly to purchase it in sacks or bottles.

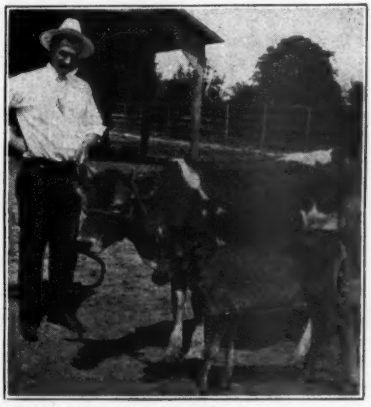
Minerals

A chain is no stronger than its weakest link, and a feed is surely no better than its worst deficiency. Numerous minerals are required for maintenance of livestock; but phosporous, calcium, sodium, chlorin, and iodin are the ones in which our common feeds are most often deficient. The amounts of these in feeds vary with the species of feed and the type of soil on which the feeds were grown. In buying or raising feeds one would do well to select his feeds so that these minerals will be supplied.

Protein

It is true that the animal being merely maintained requires a minimum of minerals and also a very small amount of proteins. But even though only a minor amount is needed, a major harm will be done if the proper amount is not supplied. And just as quantity and quality of minerals are demanded, so amount and kind of proteins must be considered. There

are possibly as many different kinds of proteins or amino-acids as there are minerals, but according to our present knowledge only five of these are essential for the animal's well being. These are tyrosin, cystin, tryprophan, lysin, hystidine and arginin. All of these must be supplied, and if one of them is missing no benefit will be derived from increasing the amount of the others. Our knowledge of amino-acids is very limited at the present time. But valuable work is being done in an endeavor to learn in which feeds each amino-acid is found. Until that information is obtained, we will have to rely upon chance alone as to whether the essential amino-acids are supplied. This explains why variety of ration is so often stressed. Beside quality of proteins one must consider the amount of protein needed. Of course the mature animal needs only enough protein to repair broken down tissues, and if a milk cow—she must have sufficient protein to produce the milk. Protein is also essential in the ration in that it increases the digestibility of the other nutrients.



PREGNANCY AT THREE MONTHS IN A CALF

A Jersey heifer calf was born on May 12, 1921, and with a male calf near its own age was turned out to pasture during the summer. On May 17, 1922, I was called to attend this calf which was then one year and five days old, and found she was about to give birth to a calf when I arrived. She was only as high as my hips, and I am not a giant. Her horns were only as long as my fingers and she had a typical calf's head. She weighed about 400 pounds and her udder contained about a gallon and a half of milk. The teats were about one and a half inches long, and her calf—a heifer, was of medium size. Both mother and calf are doing well. The owner is Wm. Pea, Decker, Ind.—Floyd Gilliatt, Vincennes, Ind.

Carbohydrates

Carbohydrates are composed of starches and sugars. Their chief function is to produce energy for the body. It is true that if an excess of protein is given an animal and not enough of other energy supply foods are given then the animal has the ability to split off the carbohydrate radicle of the protein and produce energy from it. But in doing so quite a number of waste products are left behind that prove injurious to the animal. So the animal is dependent upon carbohydrates for its chief source of energy. In addition to energy, carbohydrates are essential to the animal's well being in that they aid in the digestion of fats. When fats are metabolized in the absence of carbohydrates, acetone bodies accumulate in the body; and the animal goes into a state of coma and suffers from acidosis.

Fats

Although fats are given animals chiefly because they are concentrated forms of energy giving products, their functions are chiefly the same as those of carbohydrates. But fats also play another roll in the cycle of digestion and assimulation. The metabolism of minerals is dependent upon the activity of the para-thyroid gland and if fats are not supplied the para-thyroids lose their power to metabolize the minerals.

So if we are to sum up the selection of a ration for stock, we should consider proteins, carbohydrates, fats, minerals, and vitamines. These must be supplied and they must be in the right proportions. Then the cost, availability, palatability must also enter into the selection. Know your feeds, know your animals, and you will get better results from less feed.

MORE ABOUT ARSENIC POISONING

I hesitate to offer the readers of VETERINARY MEDICINE another article on this subject since it was so recently covered (October issue, page 445) by one of the most learned of the profession. But, as the cases here reported were handled in a little different manner, I may be justified in consuming this space and your time.

About six o'clock on the morning of August 20th I was called to a nearby farm to see a herd of eleven sick Jersey cows. These cows had spent the night of August 18 in a cotton field that had recently been dusted heavily with calcium arsenate. The owner had trusted to luck that the animals had not received a toxic dose of the poison and had made no pretense at giving antidotes.

Upon examination it was found all the animals were showing typical symptoms or arsenical poisoning in varying degrees. Subnormal temperature, black fetid diarrhea, abdominal pains, garlic-like breath, staggery gait were all very much in evidence.

Each animal was given Monsel's solution of iron, drams four, and one quart of milk of magnesia by the mouth to render the arsenic that remained in the stomach insoluble. Then sodium thiosulphate (one dram in one ounce of distilled water) was given intravenously twice daily the first day and once or twice daily according to the condition of the animals for the first three days. Beginning on August 24th all animals were given salol and bismuth subnitrate to allay the gastro-enteritis that existed. Symptomatic treatment of strychin and atrophin sulphate was given hypodermically, as was needed.

On October 16th two other cases of arsenic poisoning were encountered in cattle. These were poisoned on "Tree Killer" that had been put on trees in the pasture on October 14th. These animals showed symptoms identical to those previously mentioned and were unable to walk. These cases were treated as were the other eleven head and both have thoroughly recovered at this writing.

I attribute the recovery of these thirteen head largely to the use of sodium thiosulphate. I believe all of these animals had assimilated enough arsenic to kill them and if the sodium thiosulphate had not neutralized that which had been absorbed, I would surely have lost a large percentage of the animals described. In human medicine this drug has been used a great deal lately to counteract bad results often obtained when Arsphenamine, Neo or Sulpharsphenamine are used in the treatment of Syphilis.

Nacogdoches, Texas. D. D. Giles.

Milch goats are kept around the larger cities in Brazil. They are driven about the city in bands and milked in front of the customer's door. Photo by G. A. Roberts.

This illustration shows a 22 or 23 year old Jersey cow and her owner, Mr. Arthur Dederick, Valatie, New York. This cow freshened last in 1918 and has been milked continuously since, and gives four to six quarts of rich milk daily. Is this eleven year lactation period a record or not?—S. A. Johnson, Catskill, N. Y.

Law for the Veterinarian

By LESLIE CHILDS

Liability of Veterinary Surgeon for Injury to Animal Caused by Negligence in Throwing Preparatory to Administering Treatment

The veterinarian, in the treatment of the larger animals, must of necessity upon occasion resort to hobbling and throwing, and where an animal is vicious or unruly it is obvious that this operation may be attended by some danger. The question then, of the liability, for injury to an animal in a situation of this kind, is one that any practitioner may upon occasion be called upon to face, and appears to be of interest to veterinarians in general.

And in this connection, it may be stated broadly that, by the weight of authority, a veterinarian assumes the same liability for injury to an animal caused by negligence in throwing as he does in any other operation undertaken. It also appears, that neither will the fact that the throwing of the animal was but preparatory to another operation, excuse him if it appears that his negligence in performing this act was the cause of the injury.

This phase of the law of liability, as applied to veterinary surgeons, was passed upon in Staples vs. Stead, 167 Ala. 241, in an interesting and instructive manner. The facts and circumstances which culminated in the action were not given very fully in the report, but appear to have been, in the main, as follows:

Animal Injured in Throwing

The defendant, a veterinarian, was employed to treat a spavin upon a horse owned by the plaintiff. In preparation for the application of the cautery the horse was thrown, and, it appears, that the animal died a few hours thereafter. The death of the animal was attributed to a rupture of the diaphragm caused either by the manner in which it was thrown or by its struggles during the application of the cautery.

The plaintiff thereafter brought the instant action for damages against the defendant, alleging that the death of the horse was caused by his negligence. The defendant defended the action on the grounds, among other things, that as there was no negligence shown in the treatment, i. e., the application of the cautery, he should not be held liable. In other words, the defendant appears to have contended that as the horse was injured during the preparatory operation, of hobbling and throwing, liability should not attach to him for the injury sustained.

Court Finds Defendant Guilty

Upon the trial of the cause there was evidence to the effect that the horse was thrown upon the side of a hill, which was, it appears, unsuited for the purpose. There was also evidence that because of this the horse was thrown in an unnecessarily violent manner. Upon this evidence the trial in the lower court resulted in a judgment against the defendant.

Reversed by Supreme Court

An appeal was taken to the Supreme Court of Alabama where in passing upon the contention of the defendant, that he should not be held liable for the injury sustained by the horse during the preparatory operation of hobbling and throwing, it was, among other things, said.

Hobbling and Throwing Held Part of Treatment

"But to bind and throw the animal was a part of the treatment undertaken on the advice and under the direction of the defendant, and is necessarily resorted to in cases where the animal is unruly or violent, as the jury might have inferred was the case here. We do not doubt that the complaint authorizes a recovery on proof of negligence or unskillfulness in causing the animal to be thrown so as to produce its death in a way which ought

to have been anticipated as a probable result.

"Such result does sometimes follow, it seems, where there has been no lack of care and skill. But in this case there was evidence which may well have afforded inference that the place selected for throwing the horse—being on the side of a hill, whereas a level spot was available —was so unsuited to the purpose as to cause the horse to be thrown with unusual and unnecessary violence, thereby causing its injury and death.

"Whether, therefore, the death of the animal resulted from negligence, or was an accident, inevitable because not to be foreseen in the exercise of due care and skill, was a question which the court properly submitted to the decision of the jury. * * *"

As has been noted, the trial of the cause in the lower court resulted in a judgment against the defendant, the veterinarian. The Supreme Court, however, after the review of the evidence outlined above, turned to a consideration of other evidence, and reversed the judgment of the lower court. This on the grounds that certain evidence, which is not material to this paper, was improperly admitted upon the trial of the cause.

General Rule of the Case Stated

This reversal, however, of the judgment of the lower court in no way detracts from the clear statement of the law, in situations of this kind, as outlined in the opinion given above. From the language of the court, when taken in connection with the facts involved, it is clear that a veterinarian cannot hope to escape liability for injury caused by negligence in throwing an animal preparatory to another operation or treatment.

It is no doubt true, as noted in the opinion of the court quoted from, that there may arise occasions in which an animal may be injured in throwing which cannot be blamed upon the veterinarian in charge. Cases of accidents pure and simple, which the exercise of the utmost care could not have avoided, and in such instances there would of course be no liability attach to the veterinary surgeon.

However, in the light of the foregoing Alabama decision, it is plain that the responsibility extends through all the phases of the treatment of a case once undertaken. And that, if injury to an animal results from his negligence in any part of the treatment, directly under his control, even though it is but preparatory to the main operation or treatment, he may be compelled to assume liability therefor.

POSTMORTEM INSPECTION OF POULTRY

Increase in consumer demand for canned chicken is resulting in greater demand for Government inspection of the poultry at canning plants. Inspection for condition and wholesomeness under the Food Products Inspection Law is now maintained at eleven poultry canning plants by the Bureau of Agricultural Economics, U. S. Department of Agriculture.

This service is rendered by the Department of Agriculture at the request of the canning plants, and through cooperation with the New York Live Poultry Commission Merchants Association, the National Poultry Butter, and Egg Association, and the Minnesota State Department of Agriculture. The individual birds are examined by a qualified veterinarian at the time of eviceration and birds which are diseased, unwholesome, or otherwise unfit for food are destroyed.

Poultry canning firms using the service are permitted to state on the labels of their cans: "Inspected and certified by the Bureau of Agricultural Economics, U. S. Department of Agriculture." In September nearly 2,000,000 pounds of poultry was inspected at the eleven plants."

At the annual meeting of the U. S. Livestock Sanitary Association in December, 1928, a resolution was unanimously adopted recommending that the slaughter of all poultry for interstate shipment be placed under the control of the U. S. Department of Agriculture as is the slaughter of other animals.

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ELEVENTH INTERNATIONAL VETERINARY CONGRESS

London, August 4-9, 1930.

PROGRAM

General Meetings.

1. Foot and mouth disease (plurality of viruses; immunisation, disinfection).
2. Tuberculosis (vaccination).
3. Infectious abortion of cattle, sheep and swine.
4. Relationship of the veterinary surgeon to Animal Husbandry.
5. Veterinary Science in relation to public health, with special reference to production and distribution of meat and milk.
6. The law governing the practice of Veterinary Medicine and Surgery.

Sectional Meetings.

SECTION I. PATHOLOGY, BACTERIOLOGY AND EPIZOOTIOLOGY.

(a) Variola in domestic animals.
(b) Anthrax. (Control of dissemination by animal products.)
(c) Swine fever. (Diagnosis and vaccination.)
(d) Rabies. (Vaccination.)
(e) Distemper. (Ætiology and vaccination.)
(f) Blackleg. (Vaccination.)
(g) Standardisation of biological products (sera, vaccines and diagnostic agents).

SECTION II. VETERINARY MEDICINE, SURGERY AND OBSTETRICS.

(a) The use of drugs in the treatment of diseases caused by Nematode and Trematode worms.
(b) Milk fever.
(c) Bovine sterility (prophylaxis and treatment).
(d) Acute infectious mastitis.
(e) Diseases of the new-born.

SECTION III. TROPCIAL DISEASES.

(a) Theileriases.
(b) Control of trypanosomiases.
(c) Rinderpest (prophylaxis).

SECTION IV. POULTRY DISEASES.

(a) Fowlpox and coryza.
(b) Fowl typhoid and bacillary white diarrhœa.
(c) Fowl plague (vaccination).
(d) Treatment of parasitic diseases.

SECTION V. ZOOTECHNY AND DIETETICS.

(a) Genetics (principles of breeding).
(b) Deficiency diseases.
(c) Scientific feeding of animals.

TB ERADICATION INCREASING IN NEW YORK

During the seven months period January 1, 1929, to August 3, 1929, 40,940 herds, representing 537,744 cattle, were tuberculin tested in the State of New York under the accredited herd plan; the number of reactors revealed being 27,232, or 5.07% of the total.

This is a decided increase from the number tested during the same period in 1928.

CHANGES IN ARMY VETERINARY SERVICE

Regular Army

Captain Thomas A. Breen, now at station hospital, Fort Sam Houston, Texas, has been directed to report to the president of the Army retiring board at headquarters 8th Corps Area, for examination by the board.

Reserve Corps

New acceptances:

Arzberger, Walter Wm., Captain, 1120 Jones St., Watertown, Wis.

DeCamp, Clayton Earl, 2nd Lt., 50 Orton Place, Buffalo, N. Y.

Ericson, Eric Oscar, Captain, 5127 Dodge St., Duluth, Minn.

Isbell, George P., Captain, 314 E. Ninth St., Hopkinsville, Ky.

Juen, Henry Thomas, 2nd Lt., R. R. No. 1, El Paso, Texas.

O'Flaherty, Fred, 1st Lt., 2858 McKinley Ave., Cincinnati, Ohio.

Promotions:

Hudson, Bentley Farnell, to 1st Lt., 105 N. Main St., Moweaqua, Ill.

Kutz, Harry Cooper, to Captain, 41 Elmira St., Mansfield, Pa.

Shigley, James Fremont, to Captain, 118 S. Sparks St., State College, Pa.

Wetter, Charles Herbert, to Captain, Princeton, Minn.

Wright, Charles Clinton, to Major, 320 Arts Bldg., Vancouver, Wash.

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796 OUTBREAKS OF HOG CHOLERA IN EASTERN IOWA

The Eastern Iowa Veterinary Association reported to the public press a total of 2630 outbreaks of disease among animals during the 12-month period ending October 1, 1929.

During the year 796 cases of hog cholera were reported as compared with 562 during 1928 and 525 in 1927. The greatest number of cases, seventy-seven, was reported the week of Nov. 3, 1928.

Hemorrhagic septicemia affecting all classes of livestock and poultry ranks next in order of seriousness. A total of 525 cases of hemorrhagic septicemia were reported during the year, 277 in cattle, twenty-six in calves, five in horses, 154 in chickens, one in ducks, thirty-five in sheep, twenty-five in hogs, and two in geese.

204 Blackleg Cases

Blackleg was the next most serious, 204 cases being reported. One hundred and twenty-eight cases of hog flu were reported, 123 of contagious abortion of cattle, and 111 of influenza of horses, 109 of necrobacilliosis of hogs.

Mange of hogs apparently is increasing as ninety-five cases are reported for 1929 as compared with thirty-two in 1928 and five in 1927. Ten cases of infectious enteritis of hogs were reported.

Sixty-five cases of coccidiosis of chickens, eighty-one of roup, thirteen of typhoid, fifteen of white diarrhea, five of blackhead in turkeys, two of tuberculosis, two of pox, and

ANTI-CANINE DISTEMPER SERUM *Lederle*

Derived from the blood of dogs hyperimmunized with Canine Distemper Virus — LAIDLAW-DUNKIN Method

THE active immunization of dogs against canine distemper with Canine Distemper Vaccine and Virus (LAIDLAW-DUNKIN Method) is now well established.

Veterinarians are reporting most excellent results from this prophylactic treatment. On the other hand, many inquiries have been received for a serum for passive immunization as well as for curative purposes.

LAIDLAW and DUNKIN, in connection with their research work on canine distemper, have experimented with hyperimmune serum obtained from dogs and reported very encouraging results.

The Lederle Antitoxin Laboratories are now ready to supply a hyperimmune serum derived from dogs which have received repeated mass injections of active canine distemper virus.

Anti-Canine Distemper Serum Lederle is recommended for dogs which have been exposed to distemper and also for curative purposes. In exposed animals, the serum confers prompt protection, which, however, will not last longer than 10 to 20 days. For curative purposes, its value has been proven, especially if the serum is administered in the early stages of the disease.

Anti-Canine Distemper Serum Lederle is a refined and concentrated product, subjected to Berkefeld filtration which absolutely insures its purity and safety. The product being homologous, it cannot cause a reaction in the injected animal.

Anti-Canine Distemper Serum Lederle has been subjected to clinical tests by many prominent veterinarians and the results obtained have proven the value of this product.

The Lederle Antitoxin Laboratories distribute Anti-Canine Distemper Serum in packages containing 10, 20 and 30 cc.

Full information upon request

LEDERLE ANTITOXIN LABORATORIES
NEW YORK

one of brooder house pneumonia were reported.

Fifty-one cases of mixed infection of hogs, twenty-four of contagious abortion, thirty-two of pig scours, one of tetanus, two of tuberculosis, one of rabies, five of necrotic stomatitis, six of pneumonia, one of anemia, five of paratyphid infection, and five of pulmonary oedema were reported.

Sheep Have Coccidiosis

Sheep diseases other than aforementioned were reported as follows: Coccidiosis, one case; pinkeye, one; acidosis, thirty-five; scabies, one.

Sixteen cases of sclerostomiasis of horses were reported, twenty-five cases of strangles, twelve of azoturia, two of rabies, one of pneumonia, nine of navel ill.

Cattle diseases were reported as follows: Thirty-three of pinkeye, two of sweet clover poisoning, fifteen of garget, one of rabies, one of mad itch, seven of pulmonary edema, two of lead poisoning, sixteen of rabies.

Twenty-eight cases of rabies in dogs and one in squirrels were reported.—Cedar Rapids *Evening Gazette.*

BOVINE TUBERCULOSIS ERADICATION IN NEW KORK STATE

During the period September 23 to October 4, a tuberculin retest drive was staged in Delaware County, New York, covering all herds operating under the accredited herd plan due for retest. During this short period eleven veterinarians, retested 298 herds, representing 7,305 cattle, revealing 173 tuberculous animals on 62 farms.

During October, 1928, the initial test was applied to all cattle in the township of Colchester in Delaware County, 40 per cent of the cows being found tubercular. The retest drive revealed only 1 per cent of tuberculous animals. This exceptional result was due to the application of a combination tuberculin test; the prompt segregation of tuberculous animals; the thorough cleaning and disinfection of barns under supervision and the purchase of additions from clean areas properly tuberculin tested and not exposed to any untested animals at any time.

BULLETIN OF POISONING OF LIVESTOCK BY RANGE PLANTS

To help livestock men to identify and then guard against the plants growing on the range which are poisonous to livestock, many of the plants are illustrated in their natural colors in U. S. Department of Agriculture Bulletin No. 1245-D, "Stock-poisoning Plants of the Range," which is a revision of a former Department of Agriculture bulletin on the subject. Copies are available at 35 cents each from the Superintendent of Documents, Government Printing Office, Washington, D. C. The bulletin gives both the popular and scientific names of the poisonous plants, and also shows illustrations of animals suffering from plant poisoning. The author is Dr. C. D. Marsh, physiologist in charge of investigations of stock poisoning by plants, Bureau of Animal Industry, Department of Agriculture.

Sheep Diseases

By E. T. Baker, D. V. M.

CONTAINS:

1. A brief history of the breeds with illustrations.

2. A classification of the breeds according to the wool.

3. A description of the leading twenty breeds, with illustrations of typical individuals.

4. A brief section on anatomy—an invaluable aid in autopsy work.

5. A section on hygiene, giving rules for handling, loading, shearing and feeding sheep; for care of the buck, ewe and lamb.

6. A section on drugs and their administration, giving best methods of restraining, dosing, the dosage, table of most used remedies, contents for emergency kit, disinfectants and directions for autopsies.

7. A concise discussion of all diseases affecting sheep classified as acute infectious diseases, diseases of the blood; metabolism; urinary organs; circulatory organs; respiratory organs; digestive system; liver; peritoneum; brain and spinal cord; organs of locomotion; non-parasitic skin diseases, diseases of obscure origin; diseases peculiar to the new-born lamb, to the ewe, to rams and to wethers; surgical diseases and parasitic diseases.

8 A comprehensive discussion of plant poisoning.

9. Quarantine and transportation regulations.

No veterinarian's library is complete without this work. It contains information of value to every practitioner; information that can be found nowhere else. This work is scientific and intensely practical, and in view of the increased attention being given sheep raising in all parts of the country, of great importance.

Second edition, cloth bound, profusely illustrated, $3.00

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SAVE THE RECORDS FIRST!

"FIRE! Fire!"

Startled, men all about the Purina Experimental Farm dropped their work and ran. The steer barn was burning!

Too late to save the barn . . . cattle safe in the pasture . . . but into the flames they groped and staggered . . . feeling . . . searching . . .

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Brave hands soon found and saved that something . . . *the records!* Records that told the true story of long and patient experiments . . . records that explained the why of new ways of feeding . . . records that meant more dollars in the pocket of every Purina feeder.

Records! They're the backbone of things on the Purina Experimental Farm. Purina must guard them preciously. For it is these records that point the way to new methods of feeding . . . it is these records that are behind every Checkerboard bag in your feedlot. When you are in a dollars and cents frame of mind it is these records that will send you to the Checkerboard store every time!

NEBRASKA LICENSE EXAMINATION

The Nebraska State Board of Veterinary Examiners will convene at the State Capitol Building, Lincoln, on November 26th and 27th for the purpose of examining applicants for license to practice veterinary medicine in the State of Nebraska.

For blanks and further information address the Bureau of Examining Boards, Department of Public Welfare, State Capitol Building, Lincoln, Nebraska.

F. H. Woodring, Secy.

WISCONSIN VETERINARY CONVENTION

The dates of the winter meeting of the Wisconsin Veterinary Medical Association are January 14, 15, and 16, with headquarters at the Park Hotel, Madison, Wisconsin.

IOWA'S WINTER MEETING

The dates of the Forty-Second annual meeting of the Iowa Veterinary Medical Association have been set for January 14-15-16-17 at the Fort Des Moines Hotel in Des Moines.

WARNING

In an effort to locate a crook preying on unsuspecting veterinarians and as a protection to those practitioners now awaiting to be served by this velvet handed artist, I wish you to run a short article over our name warning the veterinarians at large of this character and to wire us our expense that we may in turn notify the police authorities to pick him up to answer charges in this city for theft of a large sum of currency from us on the night of November 1, 1929.

Description

Briefly, this party answers to the name of Cline or Klein, undersized and stout in stature, gives facial appearance of being Jewish, strong German accent, flat footed, about 55 years of age, grey hair, bald in front, when seen last wore black high shoes, blue serge pants, greenish hue pinch-back coat of gaberdine material, neat collar attached shirts with four in hand tie, a pearl colored soft hat very soiled with ribbon showing sweat marks. This party gains the confidence and fellowship of veterinarians by his unique and rare knowledge of all the veterinarians in every state in the union, their characteristics and life histories and so on. He has worked for many hospitals and from line of conversation mostly in the East. Poses as professional groomer of dogs and is quite a devotee of dog shows which also from conversation reveals that he has followed and follows extensively.

Trusting you will have available space in your Journal so that all unvisited and untouched veterinarians may be warned or that we may locate him and bring him to justice and in courtesy to a long subscriber to your valuable veterinary organ, we are,

Drs. Hufnall and Keigan,
1612 East Alabama St., Houston, Texas.

NOW IS THE TIME TO ORDER YOUR PAIR OF BOOTS

Short Legging Rubber Overshoe Boots insure you against the dangers and discomforts of damp or wet feet. Easy to slip on over shoes, yet can be rolled up and carried in grip or under auto seat.

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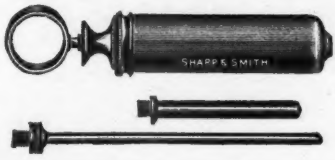

1 or 2 oz. Heavy Brass Nickel plated Double Leather Plunger Dose Syringe, equipped with 3-inch Heavy Dose Pipe and 6-inch Quittor Pipe, each 90c; dozen, $9.50.

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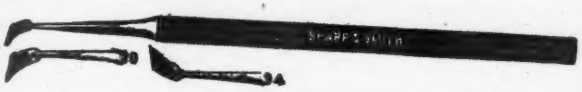

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DR. R. B. GRIMES, *Sales*,
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of
INFECTIOUS ENTERITIS VACCINE
(*Infected Herds*)
TWENTY THOUSAND TESTS
FEW FAILURES

Twenty thousand swine vaccinated in herds badly infected with Infectious Enteritis, and more than ninety-five percent recovered. The records in the office of the Hon. J. H. Mercer, Live Stock Commissioner of Kansas, prove this statement.

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(*Pigs shipped in from South*)
TWELVE THOUSAND TESTS
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Twelve thousand swine vaccinated for McLeod Brothers, Valley Falls, Kansas, at the time anti-hog cholera serum was used. Death rate less than one percent. The records in the office of McLeod Brothers, Valley Falls, Kansas, prove this statement.

Other Tests
of
INFECTIOUS ENTERITIS VACCINE
(*Some well, some sick herds*)
THIRTY THOUSAND TESTS
FEWEST FAILURES

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Payne. Iowa

THE SERO-VAC COMPANY
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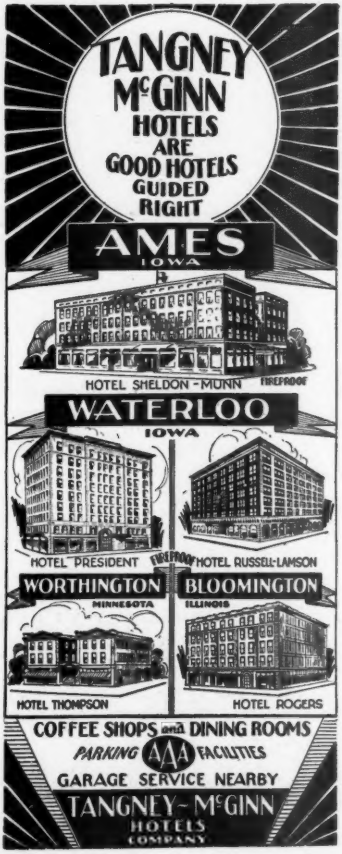
Patent pending on the process of producing this product in patent office, Washington, D. C.

315 REGISTER AT VETERINARY CONVENTION

An ever widening influence of the Eastern Iowa Veterinary association on the profession in general is indicated by the registration list at the sixteenth annual convention now in progress at Hotel Montrose, Cedar Rapids. Among the 223 practitioners registered at 6 p.m. yesterday when the registration booth closed.

Total registration at 6 p.m. numbered 315, of which ninety-two were women, the wives, daughters and sweethearts of the professional men. The Crystal room at Hotel Montrose was filled to capacity last evening for the veterinarians' annual banquet and ball.

The foregoing appeared under an eight-column head in the Cedar Rapids *Evening Gazette* of October 10, 1929. The registration included twenty-five from Illinois. Altogether four pages of newspaper space including three large group pictures was given to stories about this meeting.



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Sample on Request $4.00 a Gallon

NEW YORK VETERINARIANS STUDY CANINE DISTEMPER

The regular quarterly meeting of the Hudson Valley Veterinary Medical Society was held at Kenozia Lake, New York, August 7th, 1929. Present 36.

The speaker of the day was Dr. Adolph Eichhorn of Pearl River, who gave a very complete discussion of canine distemper and its treatment by the Laidlaw-Duncan method.

Doctor Eichhorn explained the method of preparing the vaccine and the advantages and disadvantages of its use. The discoveries made by the English commission in the study of dog distemper were referred to as valuable in connection with the study of other diseases (both man and animal), the speaker referring to certain principles that could be applied in the study of other serious diseases which had defied research workers up to the present time.

In answer to questions Doctor Eichhorn explained the technic of administering distemper vaccine and the conditions under which it should be given. He stressed the importance of having the patient in good condition before administering treatment.

KANSAS WINTER MEETING

The next meeting of the Kansas Veterinary Medical Association will be held January 7th and 8th, 1930, in Manhattan.

Chas. W. Bower, Sec'y-Treas.

"THE LITTLE GIANT EMASCULATOME"

We now offer this type of instrument so universally used for the Castration of Lambs and Calves, especially in Tropical and Semi-Tropical Countries, at a greatly reduced price.

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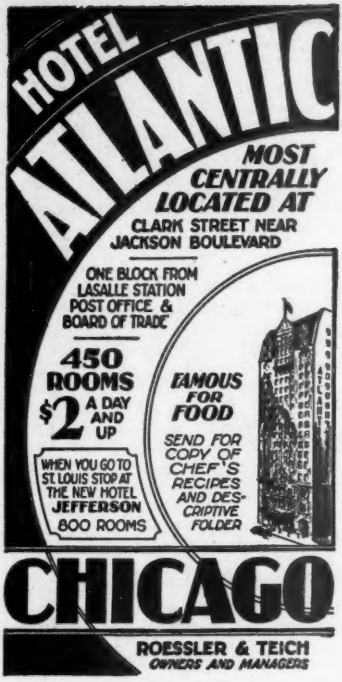
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CHICAGO PLANS BIGGEST NATIONAL FARM DISPLAY

America's farm wealth will be loaned to Chicago for one week. From Saturday, November 30, to the following Saturday, December 7, the choicest products of the livestockman's and farmer's skill will be on display at the International Live Stock Exposition at the Chicago Stock Yards.

At the more recent shows, over a hundred choice loads of fat cattle have each year been on view in the Chicago Stock Yard pens, adjoining the exposition buildings, and according to general opinion, are among the most interesting and educational spectacles of the entire exposition.

An unusually brilliant horse show is assured. Since its inception, one of the foremost horse shows of the world, the fact that for the coming event the leading horse fanciers in the country have indicated their intention to exhibit, leads to the confident forecast by the management that a horse show of extraordinary interest will take place this year.

Rail Rates Reduced

As an added incentive to many who hope to attend the 30th anniversary celebration of the International, which is acceded to be the grand wind-up of the year's agricultural show season, the railroads entering Chicago have granted reduced round-trip fares from all parts of the country.

SANTONIN
Standard Anthelmintic

Always Efficacious—Never Lethal

No one knows better than the small animal practitioner how many dogs are sickened and even killed by the use of irritant worm remedies, and

No one is more appreciative of the reliability and safety of *Santonin* even where there is pre-existing irritation of the digestive tract.

The dependability of this century-old anthelmintic is not limited to small animals. Optimum worm-expelling results are obtained in all animals.

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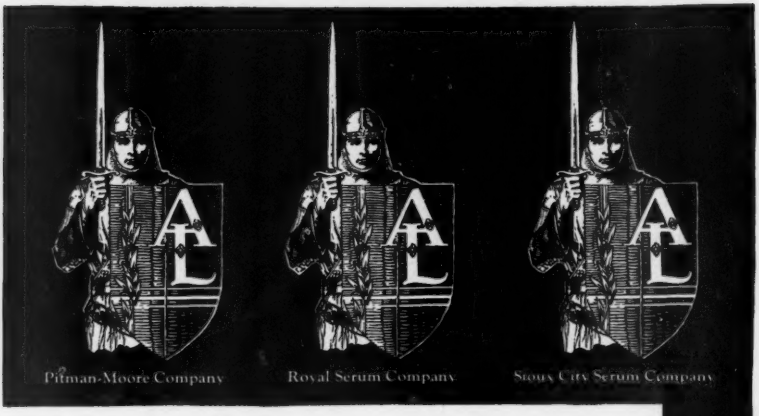
In Numbers



Five times one is sometimes considerably *more* than five. For instance, the combined staffs of the five companies now operating as Allied Laboratories, Inc., offer the veterinary profession considerably more than five times the scientific service previously offered by any one organization in the group.

Take that matter of *safety*. The Allied organization has ten of the best production men in the country. These men work together, exchanging information which under other conditions each would jealously safeguard from the others. They pool their scientific and practical knowledge to raise and maintain the standards of all our plants. Every new development in biological therapy applicable to our products is utilized—not by a single unit—but by all the Allied companies. Never before have serum and virus users had such scientific protection.

This multiplication of scientific safety factors is only one of the advantages which accrue to veterinarians who deal with Allied Laboratories, Inc.

Of equal practical importance is the factor of safety involved

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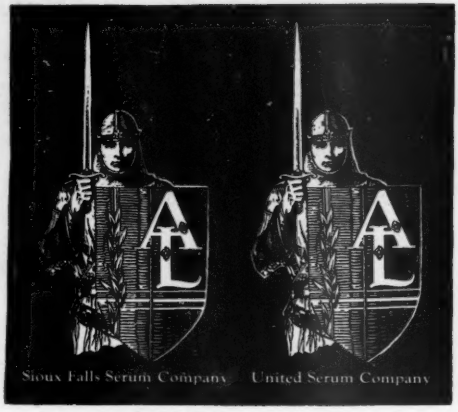

in the Allied campaign to increase the demand for veterinary service.

Veterinarians tell us this educational campaign in farm papers is persuading more and more farmers to entrust the health of their live-stock to the graduate veterinarian. No one company is financially able to conduct an educational campaign of such magnitude.

And, finally, a veterinarian dealing with a single source of supply may find that source exhausted in event of a serious outbreak. If he deals with any unit of Allied Laboratories, Inc., the merged resources of this strong corporation are at his command.

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Now offered to the profession as a curative in **CANINE AND FELINE DISTEMPER.**

This preparation has been given the most exacting field tests, covering a period of eight years, **WITH FULLY 95% RECOVERIES**

We have been so convinced of the efficiency of Germolysin-Jensen that we will guarantee 90% recoveries of all cases treated to the extent that the purchase price will be refunded should you fail to get results.

The following case report from Dr. J. E. Menter, Julesburg, Colorado, successful practitioner, and fur farm operator, is an example of many similar reports on file at this office:

GATEWAY SILVER FOX AND FUR FARM

October, 22, 1929.

Bi-Chemical Laboratories,
Grant, Nebr.

Gentlemen:
I am pleased to make a report on the results I obtained from the Germolysin I ordered from you to use on coyotes afflicted with canine distemper.

I had fifty coyotes that became afflicted and some six or seven died. The remainder were very emaciated and weak when I started using Germolysin-Jensen. I am very pleased to report very satisfactory results and in fact, I feel that I would have lost practically the entire lot had it not been for the Germolysin. I find I have far better results from the Germolysin in the treatment of canine distemper in my general practice than from any other line of treatment and I am glad to recommend it to all as it has proved itself to me.

I am using it on my Silver Foxes and one hundred coyotes this season and have had perfectly satisfactory results.

Respectfully yours,
DR. J. E. MENTER.

Julesburg, Colo.

PRICE

Germolysin-Jensen, enough for four COMPLETE treatments..$ 5.00

Germolysin-Jensen, hospital size, enough for thirty-two COMPLETE treatments..... 30.00

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NEBRASKA VETERINARIANS TO MEET IN DECEMBER

The Nebraska State Veterinary Medical Association will hold its next meeting at Grand Island, Nebraska, December 10-11, 1929. For further particulars, address the secretary, Dr. B. Witt, Scribner, Nebr.

Dr. J. F. DeVine, Goshen, N. Y., and Mr. J. Garner, West of Garnerville, N. Y., were the official judges at the hunters trials of the Scranton Hunt Club Horse Show held at Scranton, Pa., October 17, 1929. Doctors Lynett and Norton of Scranton were the official veterinarians.

Howard L. Williams, Granville, Ohio, died at his home on October 8, death being due to cerebral hemorrhage. Doctor Williams formerly practiced in Newark, Ohio. Fifteen years ago he moved to his farm near Granville and practiced there until his death, with the exception of two years during which he served as first lieutenant in the Veterinary Corps of the army, being located at Fort Reno, Oklahoma, in charge of the breeding stables. He was the first man over draft age to enter the service from his county. He is survived by a widow.

Chas. B. Hock, formerly located at Jackson, Mississippi, has purchased the practice of the late Dr. Wm. J. Ratigan of New Orleans, La.

Ours is the original swine mineral supplement to incorporate 4% Cod Liver Oil, 4% Yeast and Potassium Iodide with valuable minerals.

Valuable for abnormalities due to the deficiency of such minerals as Calcium Carbonate, Calcium Phosphate or Tri-Calcium Phosphate in feeding rations. Also valuable for use where hairlessness and goitrous conditions indicate a deficiency of Potassium Iodide.

Compounded for and dispensed only through the Veterinary profession.

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VIRGINIA STATE ASSOCIATION

The Thirty-seventh Annual Meeting of the Virginia Veterinary Medical Association was held at Winchester, July 25-26, 1929. Fifty veterinarians and twenty-six of their wives were present. The president, in his annual address, urged the ladies to organize an auxiliary, which, was done.

L. E. Star of Blacksburg read a paper on blackhead in turkeys.

J. P. Turner of Washington, and J. M. Buck of the Experiment Station at Bethesda, Md., discussed the abortion question from every angle. These two papers were of outstanding importance, and were very interesting.

W. H. Grubb of Purcellville read a paper on "Professional Ethics."

After luncheon we adjourned to the fair grounds to attend a small animal clinic. Doctor Star demonstrated several diseases of chicks and methods of holding post mortem examinations. J. P. Galloway performed several operations on dogs, and Geo. C. Faville demonstrated method of diagnosing *Fillaria imitis* by use of the microscope and on autopsy.

The banquet was a very enjoyable affair. Sixty-three covers were laid, and the members and ladies gave themselves up to a real get-acquainted time. Among the toasts, Capt. Sager of the re-mount station at Front Royal,

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The treatment of wounds in animals imposes demands that are not to be disregarded if results are to be satisfactory.

The agent employed for disinfecting tissues must be active and of known dependability.

It must not interfere with tissue regeneration in any way.

It must not inflict pain, especially in small animal practice.

It must be inexpensive.

Mercurochrome-220 answers all of the essential requirements for satisfactory use in wound treatment of animals. Two to five per cent solutions are used in treating wounds.

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VETERINARY PRACTICES, POSITIONS, ETC., furnished and handled for sale in 48 states. Physicians, dentists and nurses furnished and located. Drug stores for sale and drug positions in all states. F. V. Kniest, Peters Trust Bldg., Omaha, Neb. Established 1904.

DOG ENCYCLOPEDIA—All about dogs and all breeds, $2. Dog World magazine, $2 year. Any book on dogs C. O. D. Judy Publishing Company, 1922 Lake Street, Chicago.

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WANTED: Copies of the March, April, May and June 1929 issues of VETERINARY MEDICINE. Subscriptions will be advanced one month for each copy returned. Veterinary Magazine Corp.

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THE BUSY PRACTITIONER will find it economical as well as a practice builder to use BROWNING'S Worm Tablets in his small animal practice. The small pink tablets for round worms in puppies. The large red tablets for hook worm treatment in dogs and foxes. G. W. Browning, V. S., Mobile, Ala.

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PRACTICE WANTED: In New York state or any eastern state. Graduate Cornell University, veterinary department. Seven years' experience. Will buy practice. Address "W," care of F. V. Kniest, Peters Trust Bldg., Omaha, Nebr.

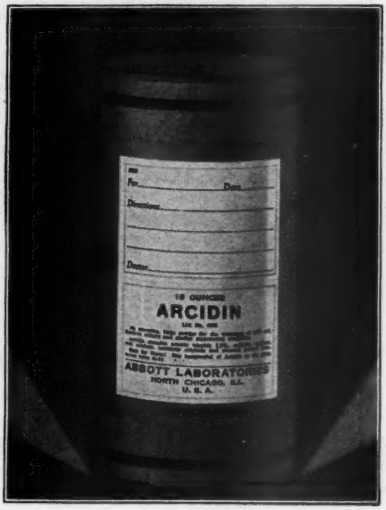
Stop self-sucking in cows for 2 cents. Guaranteed 100%. No operation. Be done in two minutes. Write for particulars. Dr. Curtis Lawton, Madison, Indiana.

told of some of the Army Veterinarians' troubles; Doctor Eichhorn described the proposed trip through Europe next summer; Doctor Buck spoke of the importance of research work; Mrs. Faville spoke for the ladies; Doctor Faville told something of his motor trip through the West; Doctor McCoy told his experiences (some of them) as a U. S. Inspector, and Dr. I. K. Atherton entertained with humorous anecdotes.

At the business meeting, the subject of a veterinary conference at Blacksburg during the winter was taken up, and it was agreed that the school be asked to put on such a conference for graduate veterinarians.

I. K. Atherton of College Park, Md., read a paper explaining the Maryland plan of hog cholera control. This brought on a very interesting discussion.

Adolph Eichhorn discussed in his usual in-



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teresting manner his visit to England and the Laidlaw-Dunkin distemper vaccine.

E. E. McCoy read a paper on sheep scab which was interesting and above all, practical.

After luncheon we attended a large animal clinic by H. E. Bemis of the University of Pennsylvania. This was the high spot of the meeting.

The next meeting will be at Staunton the second Thursday and Friday in July, 1930.

Geo. C. Faville,

VANCOUVER MEET VERY SUCCESSFUL

The Pacific Northwest Veterinary Medical Association held its twelfth annual meeting at the Vancouver Hotel, Vancouver, B. C., on July 15, 16 and 17, 1929, as per schedule. The program was closely followed, and the papers were well worth listening to.

At the banquet over 100 veterinarians and their friends were present. Dr. S. P. Talmie, Prime Minister of British Columbia, and himself a veterinarian, presided. Altogether the meeting this year was fully up to the mark in every way, and no unpleasantness of any kind marred its pleasures.

About 75 veterinarians were present, 21 of these from Washington, as follows: Doctors Hamilton, Ehmer, Wegner, Hendricksen, O. G. Button, Porter, Staggs, Woodside, Stratton, G. A. Jones, Howard, Reeve, Willers, Lull, Ackley, Hales, Prior, Edgar, Vandermeer, Exline.

At the business meeting it was voted to meet

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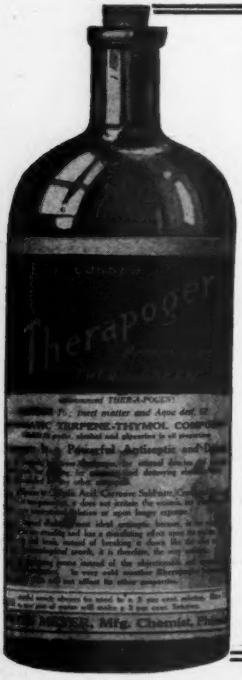

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THEODORE MEYER

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in July, 1930, at Chehalis, Wash. The exact dates will be selected and announced later.—Washington Veterinary Medical Association *Bulletin.*

UTAH VETERINARY MEDICAL ASSOCIATION

The Annual Meeting of the Utah Veterinary Medical Association was held in the Capitol Building in Salt Lake City on October 11, 1929, with a good percentage of the members in attendance, and an interesting program was enjoyed.

One interesting subject was an able paper on Anthrax by N. C. Spalding, giving history, lesions, preventive measures, etc. In the discussion it was stated that in the recent Utah outbreak the use of serum alone was not as effective as when both serum and aggressin were used; also that animals in infected territory should be vaccinated each year before outbreak occurs. It was stated that a second treatment with serum caused Anaphylactic Shock.

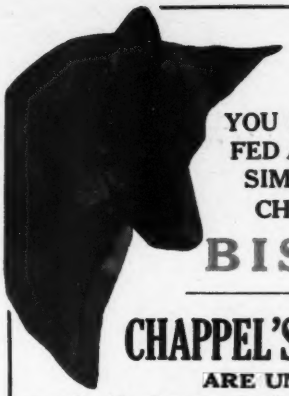
An outbreak of Chicken Pox was reported in Davis County.

W. H. Hendricks, State Veterinarian, reported Necro-Bacillosis in a herd of swine, and said two attendants had contracted the infection.

A. C. Johnson, Cedar City, was elected president to succeed himself.

W. H. Hendricks, Salt Lake City, was elected Vice President.

E. A. Bundy, Ogden, was re-elected Secretary-Treasurer.



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The Almeda Small Animal Clinic recently moved into their new hospital at Houston, Texas. The building and equipment is modern and up-to-date. The clinic is owned by W. T. Hufnall and E. E. Keigan. Doctor Hufnall specializes in small animal practice, and Doctor Keigan in large animal practice.

The following have recently been appointed to the New Jersey State Board of Veterinary Medical Examiners: W. F. Harrison, Stockton, President; H. C. Millar, Asbury Park, Treasurer; W. B. Maxson, Flemington, Secretary; P. B. Silvester, Princeton, and A. D. Goldhaft, Vineland, members.

A new organization known as the Iodin Educational Bureau has opened offices in New York City. It is supported by the Iodine Producers Association of Chile, South America.

The Bureau will collect and disseminate dependable information about iodin and iodin compounds. A large amount of research work is promised, a fellowship already being established at Mellon Institute and several other fellowships will shortly be established at other institutions, to follow up special lines of research investigation. The Bureau will be ready to cooperate at all times with others doing research work on the application of iodin in agriculture, industry, animal husbandry and in the professions of medicine, dentistry, pharmacy and veterinary medicine.

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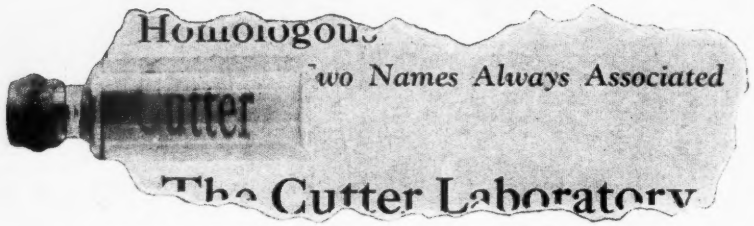

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